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**A.**—Abstract
**B.R.**—Book Review
**C.**—Correspondence
**E.**—Editorial
**M.M.S.**—Massachusetts Medical Society
**M.N.**—Medical Note
**Misc.**—Miscellany
**N.E.S.S.**—New England Surgical Society
**N.**—Notice
**O.**—Obituary
**Or.**—Original Article
**P.**—Progress
**S.N.**—Society Notice

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## Address.

### NEW ENGLAND SURGICAL SOCIETY. PRESIDENTIAL ADDRESS.*

By Homer Gage, M.D., Worcester, Mass.

*Fellows of the New England Surgical Association:*

I wish I were able adequately to express my appreciation of the honor conferred upon me at your meeting last year. To be privileged to preside over this representative body of New England surgeons is a distinction of which any member of our profession may justly be proud.

Although fully conscious of how little I have done to deserve it, I am, however deeply grateful for this expression of your confidence and shall always feel that it imposes upon me an obligation to do all that I can to strengthen our association and to make an effective force in maintaining the high standard of New England surgery.

We made a good start at a bad time. Our first meeting at Boston was very successful, and we were all eagerly looking forward to a meeting at Burlington the next Fall. We knew that we should be welcomed to one of the beauty spots of America, among the green hills of Vermont, by a demonstration of that good old-fashioned New England hospitality for which that state has always been famous.

But the great war came, and instead of the anticipated pleasure of the Burlington meeting, most of us went into government service of one sort or another, and our Association presented a picture of suspended animation. Suspended only—mark you—for as soon as we got back into our old places we began to agitate for a revival, and the meeting at Boston last year put us on our feet again.

We meet here in the old Providence Plantations under the most favorable circumstances, where, true to the traditions of its founder, there is a wide tolerance of every variety of opinion, with a strong feeling against the fanatical curtailment of our personal liberties and the infringement of the right to decide each for himself, how we may most appropriately satisfy the thirst from which man always has and always will suffer.

All this naturally suggests a little consideration of the reasons for forming this organization of ours, and for maintaining its independence in an already somewhat over-organized community.

Geographically New England has always been naturally isolated from the rest of the country,—its varied landscape of mountains, lakes and rocky coast have made it quite distinguished as the most popular vacation ground of America. The variety and richness of its autumnal coloring cannot be matched anywhere else.

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* Delivered at the meeting on Oct. 7, 1920, in Providence, R. I.

Moreover, its severe winters and its rough and rocky soil have produced a hardy race of men and women;—"intelligent and intellectually vigorous, hospitable, neighborly, much given to reading and reflection, and scrupulously conscientious with regard to their obligations to each other and the world; who grasped the great moral, religious, and political questions of the day and discussed them with a clearness of insight nowhere surpassed." This description by a loyal son of Maine, himself a surgeon and the son of a physician, of the men and women of his native town, is applicable of all New England, and defines pretty well what we mean when we speak of the New England type,—it defines what we mean by New England character and New England conscience. It applies to medical education, to medicine and surgery.

There is something about New England education and training in surgery, certain ideals in regard to the practice of surgery that are different. I would not for a moment be understood as expressing the opinion that they are better, but I do believe that they are perfectly characteristic, and am equally convinced that they are worth perpetuating.

The Southern Surgical Association and the Western Surgical Association and other local associations have already a record of great accomplishment. Our opportunity is certainly as great, and our obligation is greater, for none of them can match the wealth of New England tradition which we inherit.

Think of the boldness of Zabdiel Boylston, who made the first inoculation of smallpox in this country upon his own son, and for his advocacy of this first attempt at preventive medicine was villified by his professional brethren and forced to secret himself in his own house for 14 days to prevent being lynched; but who lived to be invited to London by Sir Hans Sloane, to publish in London the first book on inoculation, and to receive a large grant from the King in recognition of his services to humanity.

In 1800, Dr. Benjamin Waterhouse, first Professor of Theory and Practice, made the first inoculation of cow pox in America upon his four children, and later exposed them to smallpox to prove the efficacy of his virus.

Then think for a moment of the courage of Morton and John C. Warren in operating upon Gilbert Abbott on October 16, 1846, at the Massachusetts General Hospital under ether,—thus giving the first public demonstration of its use as an anesthetic, the first public proof of its efficiency, its safety, and its general applicability;—and do not forget that Warren was but one of four generations of eminent surgeons of the same name who have contributed much to the traditions we enjoy.

Nor must we overlook Henry J. Bigelow and his pioneer work on the operation of litholapaxy, and the anatomy of the hip-joint; a great teacher and dominating figure in the history of New England surgery for more than a generation.

These men were all from Boston or vicinity, but many of our best traditions come from the smaller New England towns. It was in the remote country districts that the people without our means of swift travel and communication in wrestling with the problems of philosophy, science, religion, and life in general, developed the sturdy character and intellectual supremacy that marked the descendants of the Pilgrims and the Puritans.

A farmer's boy, whose life had been spent in the then wilderness of northern Vermont, was called upon to assist a local surgeon, withal a man of character, influence and considerable surgical accomplishments, in the amputation of a leg.

Fired with an ambition to become a surgeon he offered himself at once to his principal as an apprentice, after the fashion that then prevailed. The unselfish wisdom of the doctor prescribed a preliminary course of study equivalent to the requirements of admission to Harvard College. This he did, then three years' apprenticeship with his preceptor, and for the next three years he practised his profession in Cornish, New Hampshire.

Conscious of his own shortcomings and ambitious to improve, in spite of very limited resources he went to Boston and took a course of lectures at the new Harvard Medical School, was graduated M.B., 1790, and went back to the northern country.

Impressed with the uneducated character of the physicians of that section and their lack of opportunity to acquire knowledge, he enlisted the interest of President Wheelock of Dartmouth, and the Medical Institute at Hanover was started.

That he might be the better qualified to teach, he took a sailing vessel for England and studied in Edinburgh and London and was gone a year.

Then followed ten years of teaching and hard riding over the hills of New Hampshire and Vermont, but he had the satisfaction of seeing his classes grow from 20 to 60, and his school established in high repute.

He was then called to the chair of Surgery in the New Medical School at Yale, and there he spent the rest of an honored life. But he found time besides his lectures at Yale, to give a course of lectures at Burlington, one at Dartmouth, and two at the Bowdoin School at Brunswick, Maine.

He also made many valuable contributions to the medical literature of his time,—notably a remarkably clear and vivid description of his first case of extirpation of the ovarian sac,—done six years after McDowell's pioneer work, but without knowledge of its existence.

These were the accomplishments of Nathan Smith, who stamped his indelible impress upon the medicine and surgery of northern New England, and has left us a tradition of industry and unselfish devotion to the interests of his patients and his profession, in marked contrast to the growing tendency to commercialism in medical practice.

One of his most distinguished pupils was the son of a New Hampshire farmer, who after failing to be accepted at Harvard was matriculated at Dartmouth, and graduated with the degree of A.B. in 1802.

A natural inclination toward medicine was fostered by the influence, example and friendship of Nathan Smith, and as a result, Amos Twichell became the chief practitioner and consultant of the northern country.

His ability to recognize and courage to operate for abscess of the tibia, and his successful ligature of the common carotid artery, the first successful case in our records, attest his surgical judgment and skill; that he had an opportunity to decline the professorship of surgery at Hanover, Castleton, Brunswick and Burlington, is sufficient evidence of the esteem in which he was generally held, and the wide extent of country over which his reputation was recognized and appreciated. His name still endures among descendants of those whom he faithfully and unselfishly served for so many years.

Pardon me if for a moment I refer to one more great New England surgeon of a later generation. Born in the backwoods of Maine, in a township among whose beautiful hills and lakes my grandfather toiled with the devotion and self-sacrifice of an old-fashioned country doctor, like many an unsung hero of our profession, William Warren Greene became a surgeon of more than national reputation.

His pioneer work in the development of the operation for the removal of the bronchocele was perhaps his most important contribution to surgery, but his charming personality, enthusiasm, and clearness of expression, combined with his great technical ability as an operator, made him one of the great surgical teachers of his time and generation.

Now these three men were not accidents; they were merely conspicuous examples of the kind of men that the country districts of New England have been producing from the time of their earliest settlement,—strong, self-reliant men, but full of sympathy, eager to learn, and anxious to serve, devoted to their profession, and finding their chief reward and highest satisfaction in the gratitude and affection of those among whom they lived and labored.

From such men as these, as well as from those who have made the important contributions to the advancement of surgery and surgical practice, to which we have already alluded, we have received certain traditions and ideals respecting our obligations and responsibilities to our patients, and to each other, which we are proud to inherit, and are in duty bound to keep alive and transmit to those who come after us.

In the fulfillment of this obligation I believe this association of New England surgeons can and should play an important part.

We have met as members of our state and national societies, but we have only just gotten together as New Englanders, inheriting the same traditions and inspired by the same ideals; and there surely could be no more appropriate time than this tercentenary of the landing of the Pilgrims to reconsecrate ourselves to the pursuit and the perpetuation of their splendid spirit.

Now, the lesson which we ought to learn from the study of their lives and character is the obligation to attack the problems of our generation with the same sort of courage, candor and earnest purpose to heal and to help those who have placed their trust and their lives in our hands, that our fathers used in facing their problems.

As an example, I trust you will pardon me for calling your attention to one present-day problem which I think is deserving of our most careful consideration, and is of vital importance to us all. I refer to the relation of our hospitals to the public and to the surgeon.

It is not many years since hospitals were few in number, and confined almost exclusively to the larger centers of population. It was very difficult to persuade patients to go to a hospital, and their friends to permit them to go. There was a universal dread of hospital residence, and only those entered who could not possibly be cared for at home. How different all this is now. By all classes, rich and poor, the hospital is now regarded as the safest and most appropriate place for the sick and injured.

The effect of this change of feeling is very clearly seen in the constant enlargement of existing institutions, and the remarkable increase in the number of small community hospitals. There have also sprung into existence many hospitals that are purely private business ventures. Some have a compact and selected staff of physicians and surgeons,—many have no staff at all, but are open to any licensed and approved practitioner who may choose to apply for the admission of his patients.

Their financial support comes in some instances, from paying patients, in some, from city or town appropriation; in others, from gifts, donations and bequests, in all cases it is the public who pays the bill; and the public has a right to demand that the service rendered shall be the best that the profession in that community can afford.

To no appeal has there been a more general or more generous response than to the appeal for funds for hospital support. But it is quite apparent that the response is beginning to come a little more hesitatingly, and to be more often accompanied by questions as to the character and quality of the work done, and as to the economy and efficiency of management.

This is well illustrated by the action of the Federated Charities of Cleveland, from whose drive all the organized charities of the city, including the endowed hospitals, derive their support.

In order to be sure that the hospitals deserved support, and how much support each needed, a complete survey of them all has been ordered, and is about finished.

So far as such a survey relates to matters of hospital administration, our interest is that of every member of the community; so far as it relates to the treatment of patients and the results of treatment, our interest is greater than that of anyone else.

It is of vital importance to us that the confidence of the people in the hospitals shall not be lost or lessened. The profession, and especially our branch of it, has already taken notice of this tendency, and a complete survey of all the hospitals in the United States and Canada, having 100 beds or more, by the American College of Surgeons is now nearing completion.

The American Medical Association, the American Hospital Association, the American Nurses' Association, and the Social Service Workers are all asking to be allowed to participate in order that the survey may be broader and more comprehensive. As the investigation is continued so as to include the smaller institutions, their coöperation seems highly desirable.

The title of Hospital Standardization has been given to this work, and to this I think reasonable objection may be raised as being somewhat misleading. It reminds me of an inspector from the Surgeon General's office who proposed that the camp hospitals should standardize their operations,—have a standardized operation for hernia, another for appendicitis, etc., so that they could be more easily classified and the results compared. It simply cannot be done.

Surgical procedures cannot be standardized and classified like the processes involved in the making of a machine or the building of a bridge. Questions like: when to operate, how to operate, how far operative interference shall be pushed and when it is to be refused, involve a good deal more than technical skill,—they involve that most important and most valuable quality of our profession, sound surgical judgment, and that defies rules and regulations. It cannot be cast in a mould.

The American College of Surgeons in its survey has no intention to attempt this or to make any invidious comparisons between methods or between hospitals.

It proposes to divide all hospitals into two classes, those which are satisfactory and those which are not;—and the basis for this classification is to be certain general principles in the conduct of a surgical service that are easily and accurately arrived at, and are generally applicable to all hospitals, large and small alike.

To be regarded as satisfactory a hospital must meet certain minimum requirements. These are briefly: first, that the staff, whether closed or open, shall be organized and shall meet regularly, at least once a month. At these meetings, in addition to matters of general interest relating to the conduct of the service. the clinical experience of the staff shall be reviewed and analysed, "the clinical records of patients, free and pay, to be the basis of such review and analysis."

Second, "Accurate and complete case records be written for all patients, including the personal history, a physical examination with clinical pathology and x-ray findings when indicated, the working diagnosis, treatment, progress, condition on discharge, with final diagnosis, and in case of death, autopsy findings when available." And third, "that clinical laboratory facilities be available for the study, diagnosis, and treatment of patients."

Now, these are certainly not unreasonable requirements. I think every one of us would be willing to accept them as an irreducible minimum; and yet of 617 hospitals in the United States of 100 beds or more, only 190, or less than one-third, qualified as satisfactory under these requirements in 1919.

When the survey is extended to include hospitals of less than 100 beds, I am afraid conditions will be found much worse. Few of the smaller hospitals with which I am familiar, keep accurate records, and many keep no records at all.

Now, if we are going to maintain the position of the hospital as the most desirable place for the sick and injured, and are to expect a hearty response to our appeals for funds, it is certainly up to us to do our own house cleaning if we don't want to be forced to do it by outside pressure.

I am confident that a survey of the hospitals represented by the members of this Association would disclose few that were not doing much more than is required in these three propositions; but I think that we ought not to be content with that,—that as a matter of public duty we should try to make all the hospitals within our sphere of influence comply with these simple requirements. They can all organize and they can all have proper records, and they ought to. If they cannot have laboratory facilities of their own, they can at least have the assistance of some outside laboratory in having required tests made and reports rendered.

We can, as an Association and as individuals, render a real service to the community if we will but take an interest in this work and make a real effort to help it along. Our example is often worth much more than we think,—the active support of such leaders of the New England profession as are included in this Association would give it a tremendous impetus. It is one of the things that we can do to maintain the reputation of our New England institutions.

Personally, I wish we might go a little further. I believe the New England profession and the New England public would support us in asking a little more than this minimum standard. Much of the paper work required of the Chief of the Surgical Service in an army hospital seemed to be of little or no value to anybody, and there was much apparently unnecessary duplication of reports.

But there were some reports which certainly contributed much to the efficiency and good conduct of the service, and which I think might easily and profitably be employed in our civil hospitals.

In the first place there was the regular monthly report to the Surgeon General's office which had to contain the number of patients admitted and discharged, and the number of operations; the number of deaths, a brief résumé of the hospital record in each fatal case with the result of the autopsy; if the death was from appendicitis, in addition there was required the length of time elapsing between onset of symptoms and admission, and between admission and time of operation, and finally, the number of clean wounds becoming infected, in each case the type of operation, names of operator and assistants, and the type of organism.

Anyone who is in the habit of measuring his results by his impressions will often be very unpleasantly surprised when he has to put them down in exact figures.

This report was of tremendous help to me in determining the qualifications of my assistants, and in holding them to a stricter accountability for the character of their work. Then there was the occasional report on the commoner operations, such as hernia, appendicitis and empyema, —the type of operation done, the results; and most important of all, the length of time between admission and operation, and between operation and final discharge.

If the patient was in the hospital too long before a diagnosis was made or much longer than the average period required for convalescence, it was obvious that his time and the hospital's money were being wasted, or that the best methods of diagnosis and treatment were not being availed of. Such reports afford a simple and pretty accurate means of determining the character of the work done on a surgical service, and they are as important in a civil as in a military hospital. I would have them incorporated in the blank form proposed by the American College of Surgeons for the monthly *Analysis of the Hospital Service,* and I wish further that this analysis thus amended might be made a part of the minimum requirements for preferred classification.

It should be presented first to a meeting of the staff and then submitted at regular intervals to the trustees of the institution with such comments as the staff may choose to supply. Its submission to the trustees is, I think, particularly important, because after all the ultimate responsibility for the character of the service rendered by a hospital rests upon them, and from my observation in very few instances have they any knowledge or means of acquiring knowledge of what the staff are doing.

In a survey of the hospitals of Massachusetts undertaken a few years ago by a committee of the State Medical Society we found that in not a single one was there any real check upon the character of the work done by the staff.. This seems to me unfair to the patients in the first place, to the contributors to the hospital funds, and to the staff itself. The patients have a right to demand the very best service that the community can afford; the donors of funds a right to know that the best possible use is made of their money, and every member of the staff who is doing good work himself would certainly welcome it, because he is especially interested in seeing that the reputation of his hospital does not suffer from the careless or indifferent work of anybody else.

The different factors in hospital organization have never been brought into close enough contact. Each seems to be working independently by itself trustees, executive and staff, all without that coöperative effort which is as vitally necessary to secure the best results in a hospital as it is in a business corporation.

Such reports as I have thus outlined would give them a point of contact that could not help adding to the efficiency of all. Can we not bring a larger percentage of our New England hospitals than prevails in any other section of the country up to this higher standard?

I have thus tried to recall to your attention the splendid traditions which we have inherited from our fathers and the obligation imposed upon us to maintain them and hand them unbroken to those who shall come after us.

I have referred to a line of work in which I believe we can just now be exceedingly useful. I know that the scientific contributions of the Society will be important and of far reaching influence. If we will but devote ourselves unreservedly and unselfishly to the improvement of that public service for which the community holds us responsible, I believe the success and the permanence of this New England Surgical Association will be assured, and that we shall have good reason to be proud that we were permitted to participate in its organization.

## Original Article.

# SLIDING HERNIA.

By Edward H. Risley, M.D., F.A.C.S., Waterville, Maine.

It not infrequently happens that the surgeon finds himself unexpectedly confronted with a rare surgical condition the refinements of technic in regard to which he is not entirely familiar, and the solution of the problem is not always accomplished to his entire satisfaction.

Such an experience is often presented by the condition known as sliding hernia; the exact anatomy and pathology of which are not generally clearly understood and the operative difficulties in effecting a radical cure may be considerable.

It is after an experience of this kind and with the hope of making this subject perhaps a little more definite and clear that this paper is presented.

*Incidence.* The condition was described as early as 1806. In 2,200 cases of hernia at the Hospital for Ruptured and Crippled this condition was discovered in only 36 cases. Moynihan states that it probably occurs in about one per cent. of inguinal herniae. These figures agree approximately with those of other collected series.

*Pathological Anatomy.* This part of the subject is the least clearly written upon and hence very indifferently understood by most surgeons. Hernia *par glissment* of the French, or "landslip of the colon" (cecum or sigmoid) of Treeves may be found at either the inguinal or femoral openings. It may occur both in children, where it is generally congenital, or in adults, where it may be either congenital or acquired.

It will be remembered that the peritoneum not only lines the cavity of the abdomen but envelopes most of the hollow organs, forming back of them the mesentery which conveys their nutritional supply and gives them partial support. In the case of the cecum, the sigmoid, and the bladder, the covering is only partial. The sigmoid flexure is covered in front and on both sides but a portion of the back part of the bowel is in direct contact with the posterior wall of the pelvis (iliac fossa). The same may be true of the cecum. When hernia occurs to this part of the bowel it is the posterior (aperitoneal) wall that usually precedes into the hernial opening, the peritoneally covered part

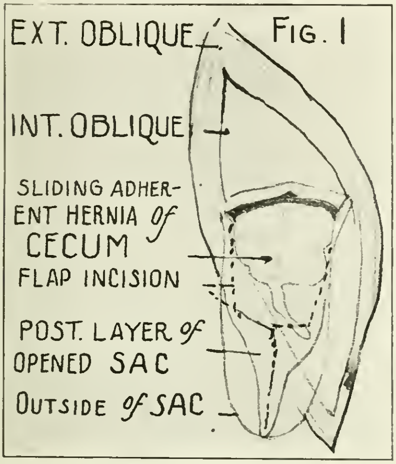


FIG. 1

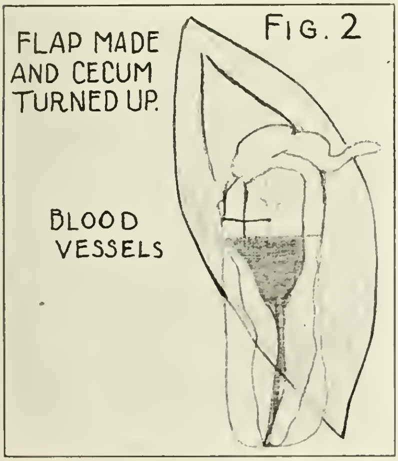


FIG. 2

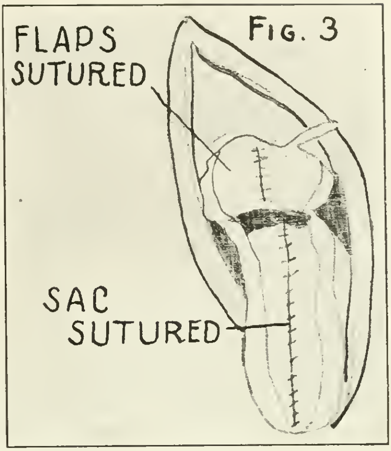


FIG. 3

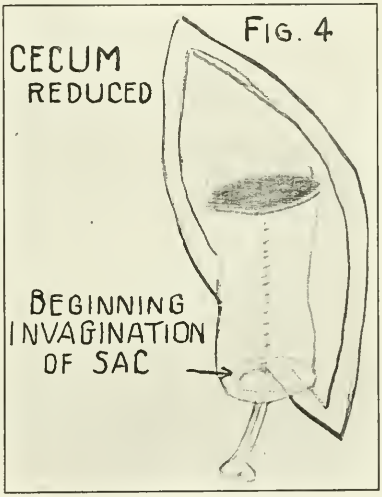


FIG. 4

of the intestine, and hence, the most prominent or presenting part of the tumor is that part which is devoid of peritoneal covering. In other words, a sliding hernia of the ascending colon (cecum) or descending colon (lower sigmoid) or bladder at times, is one in which these organs with their posterior peritoneal attachments have become displaced from their usual location and a portion of the colon with its attached peritoneum gradually slides or prolapses downward into the hernial opening so as to finally form an integral part of the posterior wall of the sac. See diagrams.

Various degrees of slipping may be present, from very slight to a complete landslip of the whole iliac fossa. The above is the probable pathology in the majority of cases.

According to Keen, on the other hand, there may be no abnormality of the cecum and no preformed or congenital pouch of peritoneum in the canal (two conditions which, however, are usually present), but the cecum or sigmoid, occupies an abnormally low position, the peritoneum surrounding it only on its anterior and lateral surfaces while posteriorly it is loosely attached by connective tissue which permits the entire organ (cecum or sigmoid) to be gradually forced downward into the canal. Keen also believes that intraabdominal pressure due to straining, lifting, or coughing, which so frequently is the cause of the ordinary type of inguinal hernia, plays but a minor rôle in the production of sliding hernia. It is rather a regular, constant pressure, or pull, of over-distended colon which gradually forces or pulls the cecum or sigmoid to a lower and lower position until it finally is engaged in the hernial canal. In such cases the hernia can never be fully reduced nor can it be properly held by a truss.

It is claimed by some writers that a sacless variety exists but Treeves absolutely denies that any such condition can occur without some form of sac.

Ransohoff presents an entirely different etiology. He states that the condition is not due to sliding of the gut and posterior layer of peritoneum, but that at first there is a complete sac, that the gut has become bound down by secondary adhesions, and upon the amount of these adhesions depends the size of the future sac and, if excessive, the sac may be entirely obliterated. Walton and others disagree with this theory because it does not explain the presence of the bladder in a hernia and also it is never possible to demonstrate a layer of sac behind the adherent colon in dissecting these herniae.

When we state the following in regard to uncomplicated sliding herniae we have stated the pathology as simply and clearly as possible. A sliding hernia of the cecum or sigmoid is one the posterior wall of whose sac is made up of that portion of the colon which is generally devoid of peritoneum.

Hence, if the operator does not anticipate this condition and opens low down on the tumor he may find that he has made an incision directly into the large bowel through its posterior aperitoneal wall (See Fig. 4). If, however, he be so fortunate as to open high up on its anterior surface he will then have opened into the upper part of the sac which is in communication with the peritoneal cavity, will be able to recognize the true condition and thus avoid an embarrassing situation.

It is undoubtedly true that the congenital form of sliding hernia is produced by the same agent that helps the descent of the testis, for the gubernaculum testis is included in the same duplication of the peritoneum that contains the cecum and hence the bowel from this action is often drawn down in the wake of the testis. A similar condition results more rarely on the left side involving the sigmoid.

We find, therefore, that if a sigmoid or cecal hernia is reducible it means that it has a particularly complete sac and probably a long meson, and hence is not a sliding hernia in the strictest sense of the word.

A real slipping hernia also involves the ascending or descending colon as well as the cecum or sigmoid. This is of necessity so because of the landslide of the posterior parietal peritoneum of either iliac fossa, which displacement affects also the peritoneum higher up along the posterior abdominal wall.

Rockey is therefore right when he states that the descending colon and sigmoid as sliding herniae can occur only on the left and the ascending colon and cecum as sliding herniae can occur only on the right. The cecum may, however, present in the canal of a left-sided hernial opening, but in this case it is due to an elongated meso-cecum and is not a true sliding hernia. The same is true of the sigmoid which presents (very rarely) at a right opening.

*Symptoms.* There may be none, even when the tumor is of large size. There may, however, be all degrees of constipation, often becoming so obstinate as to amount almost to obstruction, especially when the sigmoid is involved. Pain is not a characteristic feature, because torsion or strangulation is rare, owing to the large size of the neck and sac. Pain, however, is a constant symptom when the bladder is involved or when adhesions occur. Inability to completely empty the bladder and vesicle tenesmus are common in bladder herniae.

*Diagnosis.* This condition is oftener not diagnosed than it is diagnosed before operation. It is often not even possible to recognize the condition before operation. Especial points in diagnosis are the following: It will generally be noted that no matter what size the tumor may be, its neck is extremely large in proportion. Slowness of reduction is another feature which should lead one to suspect either cecal or sigmoid hernia, both of which are also generally direct in type. The usual gurgle which accompanies the slipping back of the ordinary hernia is absent; probably owing to the large size of the neck sac. Reduction is never complete and this is easily understood when we remember the pathology. Attempts at reduction are generally very painful. There is one other important indication which may tell us before operation what we are likely to find and that is the fact that the patient with this form of hernia can seldom tolerate the pressure of a truss. The reason for this is also evident when we consider the character of the sac contents. When one takes into account the large size of the neck of the sac, one is considerably surprised at his inability to reduce the hernia easily, and this fact alone should make one suspicious of the type of hernia with which he is dealing. This largeness of the neck of the sac accounts also for the rarity of strangulation in this kind of hernia. The presence of a large amount of gas in the tumor should put one on his guard against cecal or sigmoid hernia.

*Operative Treatment.* As previously mentioned, in speaking of the pathology, it is wise to remember that when one suspects sliding hernia he should open the sac as high up as possible in order both to be able to get into the peritoneal cavity at all and also to avoid cutting into the intestinal wall, which may form a portion of the lower part of the sac. Do not attempt to dissect the sac free from the colon, as this is practically impossible to do, and much injury to the blood supply may result. Avoidance of any injury to the nutrition of the gut is of greatest importance in these cases.

Bull and Coley reported relapses in one out of eight cases operated and other operators admit to an even higher percentage of recurrences. The reasons for poor success are evidently threefold.

1. The condition is a rare one and when suddenly and unexpectedly encountered by the average operator he is forced to repair the hernia as best he can without previously having had the opportunity to familiarize himself with the refinements in technic needed to overcome the difficulties in this particularly puzzling type of case.

2. Each case has its own individual peculiarities and so much variation occurs in these herniae that no single method of dealing with them can be advocated as being superior to any other, but the surgeon must be guided in making his choice of operative procedure by his own experience and the particular problem presented by the individual case. This statement holds true of the majority of cases.

3. The condition is one which *per se* is difficult to restore to normal because of the peculiar nature of the pathology involved.

Fiaschi has had considerable experience with sliding herniae and considers relapse largely due to the inherent vicious habit of sliding down acquired by that portion of the intestine and peritoneum which forms the sliding hernia. In order to counteract the above tendency he supplements the ordinary operation on the hernia by anchoring the offending portion of the colon to the belly wall (colopexy) through a muscle splitting incision. This applies especially to hernia of the sigmoid and is probably the most efficient method of permanently curing these difficult cases. To this procedure should probably be added castration to obviate further drag and to make closure of the sac more complete. (The author in one case of irreducible sliding hernia of the bladder in which it was impossible to separate the bladder from the sac and in which permission to sacrifice the testicle was lacking, invaginated the bladder, testicle and cord through the inguinal ring and effected a permanent radical cure of the hernia, the patient having no discomfort from his abdominally housed testicle). Practically all pseudo-sliding hernia or those with a freely movable cecum or sigmoid, which presents at either right or left hernial openings can be cured by simple replacement, high ligation of the sac (for they are free and have a complete sac and hence can be easily and entirely replaced into the abdominal cavity) and radical cure by the usual methods.

But the true sliding hernia is a much more complicated problem and is probably best dealt with by using some modification of Weir's flap method; it being paramount to avoid constriction of the bowel and injury to the blood supply and also to effect a complete reduction of the bowel in order to prevent relapse.

Various modifications of the flap method will be found necessary in different cases. Suffice it to say that this is generally the method of choice because it is practically the only method which avoids injury to the blood supply of the bowel and avoids constriction. This method is applicable in most all irreducible herniae and those otherwise suspected of being of the sliding variety. The various steps are as follows: Expose the sac and free completely from surrounding structures and cord. (This is not always easy but should be accomplished if reasonable care is used.) Open sac at its highest anterior point. Enlarge opening along anterior surface of sac so that its contents are freely visible in their entirety. Divide sac on posterior aspect to within one half inch of the caput coli, then carry incision along either side of the colon as far as the neck of the sac and one half inch from the lateral wall of the colon. Pull colon upward. Two flaps of the peritoneum with blood supply intact are formed. Suture these together so as to cover the bare posterior surface of the colon. Suture the two edges of the divided sac behind the colon which renders this latter now entirely reducible. The sac being now restored can either be invaginated by Kocher's method of pushing it up beneath the fascia and transfixing or it may be partially excised. See diagram.

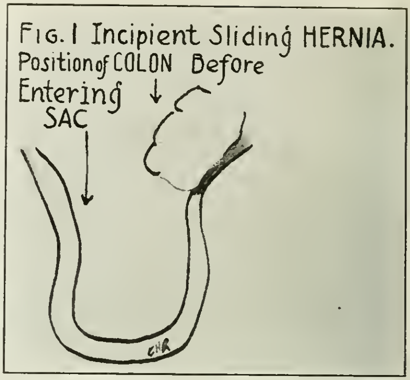


Fig. 1 Incipient Sliding HERNIA.
Position of COLON Before Entering SAC

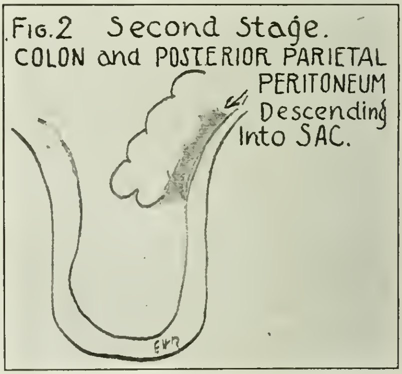
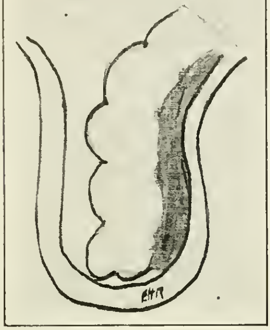


Fig. 2 Second Stage.
COLON and POSTERIOR PARIETAL PERITONEUM Descending Into SAC.

Hotchkiss in order to deal successfully with certain less marked types in which the flap method is not necessary but the colon is nevertheless irreducible, constructs an elongated meso-colon from the tissue of the hernial sac wall in such a manner as to permit of the easy and perfect reduction of the gut into the abdominal cavity and not to interfere with the suture of the internal opening of the sac. The steps of this procedure, which is really a modified flap method, are as follows: Free the sac from the cord, open the sac anteriorly, incise upward on sac to internal opening and downward to nearly the lowermost point of attachment of the meso-colon on the posterior wall, which permits easy eversion of the sac wall. Grasp the adherent colon, pull gently forward and it will be found that the peritoneum of the split hernial sac will become everted in such a manner as easily to form a new and elongated mesentery of the colon with its smooth peritoneal surface turned outward to form its free surface and its other non-peritoneal surfaces falling in contact. Suturing the edges of the new mesentery together permits its elongation

FIG. 3



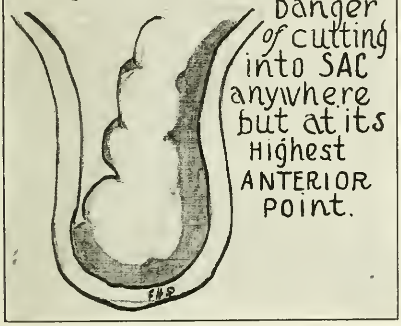


FIG. 4 Complete "LANDSLIDE" of the COLON. Shows danger of cutting into SAC anywhere but at its Highest ANTERIOR point.

to an extent sufficient to allow the perfect reduction of the colon into the abdominal cavity. The hernia is then repaired in the usual manner.

In order to further strengthen the repair the transplantation of the rectus sheath is often advisable and this procedure is used as a routine by many.

With the distinctly adherent type the condition is often more puzzling, the opening into the peritoneal cavity often extremely difficult to find, injury to the blood supply a definite danger, and a great slowing up of operative speed results. The thing here to be remembered is that the highest possible opening of the sac will generally let one safely into the general abdominal cavity and when once in, one's landmarks can be the more easily determined and the operative repair hastened.

If the surgeon will always suspect the sliding type of hernia when he finds one in which a truss is poorly borne, in which complete reduction is not possible in spite of the large size of the sac neck, or in which there is no gurgle, and always opens the sac high on the anterior surface, he will save himself much operative embarrassment and will put himself in a proper position to deal successfully with a decidedly difficult condition.

The problems encountered in the author's case were difficult to solve at first.

The patient, a man of 60, in only fair general condition, due to chronic nephritis and a low grade prostatic obstruction, had had a large irreducible tumor of the left inguinal region and scrotum for a number of years. A properly fitting truss was uncomfortable, but a loosely fitting truss gave some support, but did not completely hold his hernia. He had never had much pain until the day before he was seen, when the pain became sharp and constant, his bowels could not be moved and he felt nauseated, but did not vomit. Physical examination showed a large, soft, rather "boggy" left scrotal tumor which could be only partly reduced. Attempts at reduction caused much pain and there was marked local tenderness. A diagnosis of incarcerated and possible strangulated hernia was made, immediate operation advised and accepted. Local anesthesia was used, because of the patient's general condition. The sac was fortunately opened high and a loop of very dark colored but not entirely lusterless small intestine first presented. Below this was found a very much adherent sigmoid and a condition of strangulated hernia of the small intestine complicated by sliding hernia of the sigmoid recognized. The condition of the small intestine was very doubtful. The neck of the sac was cut and stretched, and the doubtful small intestine delivered onto the abdominal wall and surrounded by hot packs while the adherent sigmoid was being freed. This was fortunately accomplished completely enough so that the sigmoid could be reduced entirely without doing a complete flap operation. A small raw "V" shaped surface was left, however, at the lowermost part of the sigmoid loop. By the time the sigmoid was reduced the luster had returned to the small bowel; it was returned to the abdominal cavity and a radical cure done. Eighteen months have elapsed now without recurrence of discomfort. This was an atypical operation which probably would better have been done by the flap method with which the author at the time was not entirely familiar, but the result has been satisfactory.

BIBLIOGRAPHY.

Bennett and Cunningham: Sectional Anatomy.
Cannet: Annals of Surgery, 1909, xliv, 491.
Coley: Keen's Surgery, Vol. iv.
Davis: Jour. A. M. A., Aug. 18, 1916.
De Garno: Abdominal Hernia.
Eccles: Hernia: Its Etiology, Symptomatology, and Treatment, 1900.
Fiaschi: Australian Med. Gazette, Nov. 20, 1917.
Gibbon: Jour. A. M. A., 1898, xxx, 1385.
Horrocks: Lancet, 1905, ii, 85.
Hutchinson: Brit. Med. Jour., 1899.
Hotchkins: Annals of Surgery, 1909, 51, 470.
Huntington: Anatomy of the Peritoneum.
Judd: Mayo Clinic Papers, 1909.
Kocher, T.: Text-book of Operative Surgery, p. 520.
Moynihan: Arris and Gale Lecture, 1900.
Ransohoff: Ann. of Surg., 1912, xlvi, 313.
Risley: Ann. of Surg., July, 1919.
Rockey: Northwest Med. Jour., 1919, xvi, 294.
Scarpa: A Treatise on Hernia, 1809-1814.
Treeves: Hernia of the Cecum, Med. and Clin. Trans., 1887, xxiii, 2.
Treeves: Operations of Surgery, Vol. 1, 389.
Walton: Ann. of Surg., 1913, lvii, 86.
Woolson: Applied Anatomy, p. 307.

## Clinical Department.

### TORSION OF THE FALLOPIAN TUBE.

BY SAM S. DEARBORN, M.D., F.A.C.S., NASHUA, N. H.

THE following case may be of interest because of its comparative rarity.

Mrs. C., aged 50, married twice, no children, no miscarriages. A vigorous, active woman.

Previous history: Nothing unusual except at intervals of a few weeks or months moderate pains in lumbar region and both sides of pelvis lasting for a short time with complete absence in the intervals. Appetite, digestion, and bowels normal. Catamenia every three and a half to four weeks. Five years ago, excessive in amount; of late years normal, both as regards pain and amount of flow. Slight leucorrhoea.

September 8, after working in her garden, which necessitated stooping over, was taken with rather severe pain in right loin. Examination revealed marked tenderness in region of right kidney, the lower portion of which was palpable and freely movable. Pulse, temp. and urine normal.

September 9. Pain now in the region of McBurney's point and tenderness over the same area. No spasm, distention or rigidity. Vaginal examination showed an apparently normal uterus. Slight feeling of indefinite resistance in both fornices. Pulse and temp. normal.

September 10. Pain at intervals, not constant, but more severe through whole lower abdomen. Tender over both Morris' and McBurney's points. Increased resistance to abdominal palpation, although no absolute rigidity of the recti: moderate distention. Nurse reports a slight "show" of blood from the vagina during previous night. Vaginal examination revealed a tender mass behind cervix. Both fornices less tender but somewhat resistant. Examination not very satisfactory because of fat abdominal wall, distention and general tenderness. Pulse, 90; temp., 100.6. Bowels have moved freely. No nausea or vomiting.

Diagnosis: Probably appendicitis with salpingitis and less probable, extrauterine pregnancy. Operation advised and accepted.

The right tube was found to be enlarged to twice its normal size, twisted once and a half on itsel, black as gangrenous intestine; the fimbriated end lying behind the uterus just above the junction with the cervix: the right ovary was the size of a plum, somewhat darker than normal, and contained several small cysts. The left tube was enlarged to three times its normal size, slightly injected in appearance and filled with a pale, straw colored fluid. The appendix was enlarged, convoluted, its vessels deeply injected, and it contained a concretion in the tip. Tubes, ovaries and appendix removed. Uterus was allowed to remain because of the patient's condition. Convalescence uneventful.

## Society Report.

### PROCEEDINGS OF THE NEW ENGLAND BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION, MAY 19, 1920

THE New England Branch of the American Urological Association met in the parlors of the Hope Club, Providence, Wednesday, May 19, 1920, at 8.35 P.M. Dr. O'Neil presided. After the regular routine business, patients were presented and discussions were had as follows:

DR. GEO. A. MATTESON: This case is one of hypernephroma presenting several unusual features, of which the most interesting are: first, that the secondary metastatic development in the right iliac bone preceded the recognition of renal tumor or any urinary symptoms; and, second, the high degree of arterial vascularity, giving the tumor the characteristic of aneurism, namely, marked expansile pulsation and a loud systolic bruit.

The first diagnosis was aneurism. Of course we appreciated that there was scarcely a vessel in that vicinity which would be large enough to develop an aneurism of that size, but it wasn't so far from the superior gluteal artery, and we felt it might possibly be that. In our ignorance we attempted to remove the tumor and found it very difficult indeed, and cut into such a hemorrhage that the removal was very incomplete.

Our pathologist reported that the tumor was a chordoma. I believe only 17 cases have been reported. That was the diagnosis which stood until we sent the man to the Huntington Hospital, Boston, for some radium treatment. Another specimen was taken and a tumor in the kidney region had developed, which up to that time had not shown, there being at no time any urinary symptoms. This specimen was reported by Dr. Wright as hypernephroma.

The patient, since that time, has had six treatments with radium at the hospital at Boston, but his general condition is still going down. It may not be new to others of you more experienced than I in this line of work to find that his tumor is so pulsating.

The patient is presented. A man of 45, emaciated and cachectic, having in the right sacroiliac region, a diffuse tumor about eight inches in diameter which pulsates visibly. At the summit of the swelling is a fungoid mass of necrotic tissue projecting from a sinus one inch in diameter in the middle of an operation scar. The sinus extends down to an erosion perforation in the wing of the ilium, as shown by radiograph. There is also a palpable mass in the area of the right kidney—in which pulsation can *not* be demonstrated.

Dr. Matteson also placed on exhibition a radiograph print and a stone taken from the kidney, interesting on account of its size, it being a spherical phosphatic calculus with a harder case, measuring 2⅛ x 2⅜ inches in its two principal diameters. The kidney had been reduced to a shell almost without functional value and was removed.

Dr. Arthur T. Jones: I had a man sent to me with idiopathic gangrene of the scrotum.

The following history: Saw him February 14th, this year. Previous history negative. No venereal history. A few days previously he had complained of pain in the testicles. He went to a doctor in the neighboring city of Pawtucket, who applied an ichthyol ointment, 25%. When he came into the hospital his scrotum was four times normal size, gray and oozing, and on the verge of sloughing. We made incisions in the hope of saving it, but it was pretty well degenerated. About five days later his entire scrotum sloughed off, leaving the testicles bare. It came off around the base, as if some strong irritant had been applied; also a ring around the penis that was denuded and sloughed, and another area near the glans penis. This was superficial and under treatment of plenty of peroxide healed nicely. It was a question of whether to castrate or make a new scrotum. We decided to cover the two testicles, which we did on March 19. We lifted a portion of skin from each thigh and shoved those flaps over and united them in the center, leaving an area on either thigh for skin grafting. This area contracted down so he didn't have to be skin grafted. The third of April he was discharged as well.

Since then, on May 6, I saw another case. No venereal trouble or injury of any kind. In this case, a small scratch appeared on the prepuce. He said he got it from a pin in his drawers. He denied absolutely that there was any possible venereal disease. I think he was perfectly honest. In view of the other case that I had had, I suggested that he probably would have sloughing of his scrotum. This did occur, and the anterior surface of scrotum sloughed away. The entire skin of the penis has sloughed clear to the very base. His general condition is good and he is coming along all right and will evidently have enough scrotum to stretch over and cover the testicles. I would be very glad to show the result if you wish. (Patient is produced. First case reported.)

I undermined the edges and slid them over and united the edges in the center, using a mattress suture, after making a curved incision on the inner aspect of both thighs, dissecting the outer edges of the flaps free. The outer edges were caught down with a few sutures to the fascia to keep the testicles from slipping out from beneath the flaps. Both testicles are in one sac.

### RUPTURE OF THE RENAL ARTERY.

Dr. Cook: The case presented considerable difficulty and was seen by several doctors. The man was sixty-four years old, apparently in perfect health. He was taken suddenly with a fainting spell and fell. This was not regarded as serious. The family doctor was called and he said he was all right. On the third day he developed a very severe pain in the hypochondrium.

The pain was so severe he called in Dr. Cherry, who examined the man carefully and thought he had a gall-stone or abscess. It was after he was in a dying condition, and two days later, when a large mass which filled the left half of the abdomen became apparent. I was called in that afternoon and found this man practically pulseless, with this mass filling the left half of the abdomen. It felt like a large spleen. The man's blood pressure was 75 m.m.

We were fortunate in securing an autopsy.

We found a clot of blood situated behind the peritoneum about fifteen inches long, largest diameter perhaps five inches across. The intestine was stretched across this region. The autopsy was done at night and this mass was taken out. We discovered, the next day, the whole thing was hemorrhage, and the renal artery was found. I asked Dr. Cherry if that mass was present when he saw the man, and he said "No." So, evidently, this slow hemorrhage was going on for five days, finally resulting in death through hemorrhage.

## REPORT OF A CASE OF INFECTIOUS ANEURYSM OF THE AORTA.

Dr. W. C. Quinby: Patient was a middle-aged woman of negative family history as well as of negative Wasermann reaction. For a year previous to entering the Peter Bent Brigham Hospital she had had evidence of a chronic infection: first, an acute condition in the right knee; then, a few months later, an otitis media, and then pain and lameness associated with the region of the left hip joint. She had been in two hospitals previously. On reaching us she showed a fever, leucocytosis, and definite abscess in the left flank, with fullness and redness. She was operated on by the resident physician, Dr. E. C. Cutler, and a perirenal abscess opened and about a pint of pus evacuated. On investigating the depth of the abscess cavity a soft area was found which showed pulsation synchronous with the radial pulse. No further effort was made to find the origin of what was apparently an aneurysmal sac. The wound was drained and the patient put to bed.

About a week later she had a sharp hemorrhage from the wound and it became manifest that the condition must be further investigated. On the assumption that the aneurysm was of the renal artery I made a median incision high in the abdomen, intending to ligate the renal artery at its junction with the aorta. In the meantime the patient was transfused. On reaching the anterior surface of the aorta, however, it was found that the aneurysm was of this vessel itself and not of the renal artery. I therefore closed the abdomen. About ten days later, the patient had a second severe hemorrhage which proved fatal.

At autopsy it was found that the primary cause of the trouble was a psoas abscess which, having existed over a sufficient length of time, had eroded the lateral and posterior wall of the aorta which had become infected. In other words, the aneurysm was of the true infectious type and was in no sense due to disease primary in the vascular wall.

Dr. E. B. Smith: I will report briefly a case of transposed viscera which I discovered at the operating table a few days ago. This case is interesting to me because of its rarity, in my experience, and also on account of mistaken diagnosis on my part.

A woman of 62, rather stout, had been complaining of abdominal pain with some nausea and vomiting for two years. Increasing constipation, never amounting to obstipation, however. Patient had lost weight steadily for a year. Upon casual examination of the heart, the sounds seemed rather distant but appeared to be normal. Urine showed no blood or pus. A very large, slightly movable tumor was found in the left side extending from the costal border to the crest of the ileum. It seemed incredible to me that there could be an intestinal tumor of that size on the left side without obstruction. I believed it was hypernephroma and made an incision through the left rectus with a view to removal if possible. It was then that I discovered that the viscera were transposed and the growth was cancer of the cecum.

Dr. Keefe: A girl, 11 years of age, was brought to us for treatments for enuresis, or bed wetting. The history is as follows: Father and mother living and well. No history of T.B. or cancer in the family. The patient had her tonsils and adenoids removed two years ago. Eyes—pupils equal and react to light and accommodation. Teeth—in good condition. Tongue—clean and moist. Throat—clear. Lungs—resonant throughout, tactile and vocal fremitus normal. Heart—normal in size and rhythm, no murmurs present: Abdomen—soft and tympanitic throughout. Reflexes—active. Extremities—normal. January 30, 1920, sp. Gr. 1010. Sugar—none. Albumin—slightest possible trace. Reaction—acid. Large number of squamous bladder cells and a number of pus cells.

She now attends a boarding school where those about her have found the continual bed wetting very annoying, as well as the frequent desire to micturate during school hours; also the incontinence of urine during the day.

In this case, the enuresis has existed since infancy. The bed wetting occurs three or four times during the night, with occasional incontinence during the day. She has been treated by a number of physicians with medicine, but her distressing condition remains unimproved.

Her home surroundings are exceptionally good; she is the picture of health, strong and well developed. Her mother has again and again tried to impress upon her the necessity of gaining control of the vesical sphincter. At times she has offered her rewards to induce her to make an effort to control the incontinence, and again she has punished her by taking away certain privileges; but all her efforts have proved to be unavailing.

The child, who is the only girl in the family, has been pampered and petted since she was born. She speaks with a lisp and very little has been done to correct this defect; on the contrary, admiring relatives and friends induce her to speak in order that they might hear and approve of this lisp, it sounds so cunning. Mentally, the child is not as far advanced as other children of her age.

I believe that the lack of control of the vesical sphincter is also due to the difficulty of creating enduring mental impressions in the brain.

February 13, 1920. Ether—cystoscopy. Bladder—normal, with the exception of congested and dilated blood vessels at the vesical outlet. The urethra was dilated to allow the introduction of the cystoscope. The night following the dilatation method there was no bed wetting. However, about five days later she again wet the bed.

Ether was again administered March 2 and March 9 and sounds were passed into the bladder—numbers eighteen to twenty-eight, French scale. A 10% argyrol solution was injected into the bladder with irrigations of boric acid twice a week.

[NOTE—May 18, she has wet the bed but once during the last three weeks, and has complete control during the daytime.]

Enuresis or bed wetting is a condition found among rich and poor, healthy and unhealthy children.. It is a persistence of an infantile habit, which in the normal child is controlled about the third year. Control of the vesical sphincter lies in nerve centers in the lumbosacral cord and in the brain. Numerous causes of enuresis have been put forth by writers on this subject: malformations, phimosis or adhesions around the clitoris; yet we find circumcision has failed to cure in a large percentage of cases; partial asphyxia during sleep from adenoid vegetations: pin-worms; deficiency of thyroid secretion; neuro-muscular fatigue.

I doubt if any one of the cases above mentioned exercises any appreciable influence on this condition. I believe that mental retardation is the most potent cause of enuresis. The condition appears to have no relation to mal-nutrition, but to be dependent upon the lack of lasting impressions made upon the brain cells. A sufficiently definite impression upon the brain cells must be made during waking hours, which impression must last during sleep, in order to prevent relaxation of the vesical sphincter muscle.

We are all familiar with the fact that many persons before going to sleep are able to make so deep an impression in their brain cells that they are able to awake in the morning at any hour they desire. Where we have many causes assigned to a disease, we have variety in the methods of treatment.

In the treatment of these cases, judicious management is essential. The patient should be helped, encouraged, and taught to have self-confidence. Suggestion has an important bearing. Complete change of environment, and even removal to a hospital may be necessary in certain cases, when the home influences may be at fault.

A regular and plain diet with sufficient time for rest is desirable. The child should not be given fluids for two hours before retiring and may be awakened several times during the night to anticipate the involuntary by a voluntary emptying of the bladder. The passage of sounds into the bladder has been effective in many instances.

Belladonna, strychnia, and thyroid extract have their advocates. During the late war, many distressing cases were found among the soldiers and sailors and some were benefited and others cured by the use of electricity.

A number of cases have been treated by lumbar puncture. Following the withdrawal of 10 c.c. of the spinal fluid an equal quantity of physiological salt solution has been injected into the spinal canal, with the results that many patients have been cured, even those of long standing, in adults.

To sum up, I believe that the principal cause of enuresis is a mental retardation.

Question by Member: Did this child have a residual?

Dr. Keefe: No.

Question: You say she did have pus in the urine?

Dr. Keefe: At the beginning; but after the treatment of boric arid irrigations that entirely disappeared.

Question: How do you account for pus in the urine?

Dr. Keefe: I don't know just the cause.

Dr. W. D. Bieberbach: A man about 25 years old, came to me on account of frequency at night. He was not annoyed during the daytime, but would urinate seven or eight times during the night. On examination I found that the urine in the three-glass test was clear and sparkling, no evidence of pus. The bladder wall was normal, but the trigone intensely reddened and the inflammation extended to the posterior urethra.

I catheterized both kidneys and the pig was inoculated. The right kidney pig lived about six weeks and on post-mortem was negative. The left kidney pig died at three weeks with a colon bacillus infection of the peritoneum.

I have started the patient under treatment by irrigating the sick kidney with silver nitrate solution. While he has been treated only twice, his frequency is down to about twice at night.

By a Member: It is rather hard for me to see Dr. Keefe's explanation of mental retardation when asleep. It would seem to be a part of automatic control. I fail to see how it applies at night if the patient sleeps. Furthermore, it does not balance up with the situation we know rather vaguely about. You have an automatic bladder which is entirely cut off from the central nervous system, at least the cerebrum. That bladder will hold water up to a certain point of distention. Scratching the thigh or stroking the abdomen will cause that to empty itself. That apparently is the condition which attains when the bladder is free from any control whatever by the cerebrum.

Dr. Keefe: Of course, we know there are reflexes in the spinal cord, and whether we have educated the spinal cord from our brain originally we can sever the cord and the cut contracts the muscles. I cited that instance that shows that at night, while we are asleep, we do control definite things that produce our awakening at a certain time; that shows that our mind in a subconscious state does work while we are asleep; so is my feeling with regard to these patients. Though you can't cut the cord, some bladder control is due to the education of the centers in the cord. Besides, I feel that as the brain is defective, these impressions are not sufficiently definite in the brain cells. For instance, this patient may not remember and forget things more readily than a child whose mind may be more easily impressed. So, it would seem to me that we do have a subconscious working of our brain during our sleeping hours, and I am inclined to think that dilatation near the neck of the bladder may be sufficient to set up some impression in the brain and thereby help the brain ultimately control the bladder.

Because this patient had done it so many years, just the delight at not doing it during these five days (something which had never happened before) was sufficient to awaken and coördinate the necessary impressions. Some cases in the Army were treated by electricity and my feeling is that besides using the electricity an impression is made on the individual and brings to his consciousness the fact, and thereby awakens a subconsciousness in his brain which acts during his sleep.

Dr. Donley: From the viewpoint of a neurologist, Dr. Keefe's paper is of much interest because it is obvious that although he is concerned with the symptomatology of one viscus, his vision sweeps a wider horizon. It is, of course, common knowledge that the bladder is affected functionally by a number of influences playing upon it, and that these influences, whatever they may be, mediate their effects through the nervous system. Hence, it is no mere hypothesis that the nerve control of the bladder is very important, and so it seems to me that the opinions set forth by Dr. Keefe are worthy of this serious consideration, if for no other reason than this, that they will help explain why we so often fail to relieve these patients by treatment directed to the bladder alone. And, again, they will perhaps shed some light on the problem as to why so many diverse treatments have similar successes to their credit. If the nervous factor is as important as Dr. Keefe thinks it is, then our therapeusis ought to take that fact into consideration.

I know this little patient of Dr. Keefe's very well and it has been really surprising to watch the way in which bladder control has been established in direct proportion to the improvement in her mentality. She was not feebleminded or backward in the usual sense, but she was, by reason of injudicious education in a distinctly childish mental condition. With the removal of her infantile mental fixations, her infantile bladder, if I may express it so, has shown a corresponding improvement, that is to say, she has substituted voluntary for merely reflex control of the organ. Whether, and in what way, we can reëducate these irritable bladders it is difficult to say, but it is surely of value to have our attention directed to the matter in a way Dr. Keefe has done it, and I, for one, am glad to learn that urologists are not infrequently neurologists as well.

Dr. L'Esperance: Dr. Keefe has mentioned the fact that this child was infantile along other lines and that has been a frequent observation on my part that this appearance is common with children suffering from enuresis. In the clinic we frequently ask the nerve specialist to grade these patients before treatment is recommended. We treat the normal child with the assistance of the mother and successful results depend greatly upon her faithfulness in carrying out home treatment.

In mentally defective children, from the low to the high grades, the results of treatment vary according to the grade of mentality. A certain amount of brains is necessary for reëducation of bladder function.

Yesterday a boy seventeen years of age came to the clinic: his appearance was not that of a very bright person. In the course of examination it was found, among other conditions, that this patient was now sleeping, and had always slept, on a feather bed. I believe that is a very common contributory cause of enuresis.

One of the most interesting patients I had very early in my medical practice was a young lady, who had reached the age of sixteen and gave a history of having always wet the bed during the night. In the presence of this young lady a uriniferous odor could be detected at all times. This was very humiliating to herself and her family. This patient I treated only three times. The urine was clear and negative and a cystoscopic examination showed a normal bladder except that two ounces of fluid was all she could hold comfortably.

On the second visit, I gradually dilated to about six ounces, the third to ten ounces. This patient wet the bed only once after her first treatment and on that occasion after eating sour pickles and drinking much water before retiring. I know this young lady very well, also her family, and I have been informed by her mother that she has never wet the bed since her treatments, over ten years ago.

The fact that enuresis is caused by many different conditions eliminates the possibility of a cure with one kind of treatment.

**Dr. E. G. Crabtree:** I have to report a similar case to those already discussed which, I think, emphasizes the effect of fright occasioned by an operative procedure on a subnormal child in clearing up troublesome lack of urinary control. The child was six years old, the adopted son of a South American family. He had a subnormal mental condition with physical deformities consisting of a high arch of the hard palate with considerable attendant nasal obstruction and a partial row of double teeth, shown by x-ray; also a spina bifida. Urinary difficulty has been more pronounced in the South than since his return to America, and consisted of frequency and incontinence, with an occasional escape of urine at night. Most of his trouble was passing of the urine into his clothing during the day. His mother had taken great pains to attend to this condition by careful explanations, without success. The child apparently gave attention to his instructions, yet the condition was not influenced. On the possibility that we might be dealing with a diverticulum, congenital stricture or some other abnormality, ether cystoscopy was done. No deformity other than the spina bifida was found. The child resisted ether and in general had an uncomfortable experience. After recovery, he has shown complete control over himself in the day time, but there has been no change in the condition at night, and once or twice a week urine escapes from him in his sleep.

The explanation of this sudden change seems to me to be twofold. The child has been in much better general physical condition since coming to America, in a cooler climate, than he was in South America. The other thing which stands out as a part in the change is that the child links up his ether struggle as a sort of punishment for not controlling his urine by day. The experience has made a profound impression on his mind and seems to be the chief factor in accomplishing an improvement.

**Dr. Bieberbach:** A boy of 19 wet the bed at night. When the war broke out he was a member of a local military company and was sent across with the 26th Division. When he started across he noticed that his trouble at night disappeared. No wetting of the bed occurred while on the firing line or during his after service in the army. It is now almost two years following his discharge from the army and he states that he has had no return symptoms of his former trouble. At the present time he is married and apparently in good physical condition.

**The President:** During the war I was surprised to find the number of cases of enuresis. I had never known its prevalence in adult life. I thought it was confined entirely to children.

### PROSTATECTOMY AT THE BOSTON CITY HOSPITAL.

**Dr. H. H. Howard:** When Dr. Thorndike and I went on service last fall, we were determined, if possible, to cut down the high mortality rate in cases of prostatic obstruction.

As you probably all know, cases which come to any municipal hospital are not cases which would be considered most favorable risks from any standpoint.

On carefully going over the previous records in these cases, it was rather interesting to find that a number of them were operated all in one stage and very few were done in the two-stage operation. The mortality in the one-stage operation is alarmingly high and in many cases which had been operated on in the two-stage operation, the mortality following the first-stage operation was also alarmingly high. Many of the cases were operated upon the day after admission and the majority within forty-eight hours after admission.

From the results of these cases we determined first, that the interval between the man's entrance to the hospital and his operation was altogether too short; second that in the cases where the first stage was done and followed by death, that something in the after-care was radically wrong, that the interval between the first and second stages was, in most cases, altogether too short, so that the following plan was adopted:

An ambulatory case coming into the hospital with prostatic obstruction, first had his 24-hour urine carefully gone over, together with his blood urea and phthalein test. If the blood urea was high the man was put on a restricted diet with forced fluids, some urinary antiseptic was given and rather active catharsis followed out. In the majority of these cases the blood urea came down within a week. During this time the man was not permitted to lie in bed, but was kept up and about and an endeavor was made to get him acquainted with the other patients in the ward and interested in games, and things other than his own general condition.

If the case was bedridden at the time of entrance and after examination no reason was found why he should not be permitted to get up, the patient was made to get up, at first for short intervals of time, and then gradually for the greater part of the day. Most of these bedridden cases were cases with high urea nitrogen and dirty bladders.

Cases that came in with over-distended bladders were treated with an indwelling catheter and frequent irrigations for a period of about a week before the first stage was attempted. Following the first stage, those cases in which the urine had been full of pus and the patients running a rather high urea nitrogen, in all these cases before they left the operating room, subpectorals of a thousand cc. salt solution were given and this was repeated every four hours thereafter if the patient showed any evidence of vomiting, headache, or any of the other symptoms of uremia from absorption.

All first-stage cases were gotten out of bed on an average, the fourth day after operation. The average length of time between the first and second stages in fifty-nine cases was a period of ten days; the maximum was four weeks. Between the first and second stages all the cases had a second urea nitrogen done and a second phthalein.

In the three fatal cases which were done in this series of operable cases, it is interesting to note that the urea nitrogen did not come down in all of the time lapsing between the first and second stages in spite of any kind of treatment. The phthalein test was used merely as a color index and nothing more, the most stress being placed on the urea nitrogen test.

All of the cases between the first and second stages had frequent bladder irrigations and the only solution used was hot boric salution.

Following the second stage, in almost every instance, the cases were given subpectoral salt solution of a thousand cc. before leaving the operating room and the house officers were instructed to give subpectorals in the ward at the first evidence of a developing uremia. They were gotten out of bed within practically the same time as the cases following the first stage and induced to get associated with the men in the ward who were up and about and also to get interested in games, and the old men who were weak and unable to get about without assistance, were led up and down the pavilion by other patients who were farther along in their convalescence. Dr. Thorndike and I both came to the conclusion that the spirit of good-fellowship and getting a man interested in something besides his own troubles, had a great deal to do with his convalescence.

In none of these cases was an indwelling catheter placed after the second stage, and the suprapubic drains were all removed on the fourth day. It is interesting to note that in these cases none developed an epididymitis; only where sounds were passed before the man started to urinate in the normal way did any case of epididymitis develop, and these were few and far between.

From the experience gained during this year we came to the conclusion that the urea nitrogen test is of inestimable value; that a great deal is gained by first getting the man accustomed to the hospital and hospital conditions, regulating his diet, and carefully studying the man as regards his whole general condition. We also came to the conclusion that in practically every instance where death followed the first stage it was usually due to lack of sufficient fluids. This also held true following the second stage. Thirdly, the less you do to the urethra the less the chances are of the case developing an epididymitis.

Question by a Member: What is the limit of blood urea you think safe to operate?

Dr. Howard: We have operated on one as high as thirty. Dr. Ohler rather thinks twenty-five is about the limit.

Dr. Chute: I do not understand why Dr. Howard waits before giving preliminary operation.

Dr. Howard: We wait for the simple reason that most of these old men when they come in, for the greater part, have a high blood urea, distended and dirty bladders—old fellows not accustomed to hospital life—and by getting them cleaned out and accustomed to their surroundings and allowing their blood ureas to come down, results are much better.

Dr. Chute: I cannot see any advantage in not opening them up at once; you thus start them on the up grade at once, you relieve what causes retained urea; you have to watch the kidney reaction, but it seems to me that you waste just so many days in waiting.

Dr. Howard: We have found in a definite number of cases that by waiting, the blood urea does come down without operative interference and at the time of operation they are much better surgical risks and stand the first stage with much less shock than those that are done within forty-eight hours after admission.

Question by Member: If you drain suprapubically, why not take away the pressure early?

Dr. Howard: In only the cases that come in with chronically and very much distended bladders do we use the indwelling catheter and we do that to prevent hemorrhage and severe shock which does follow this type of case in a great many instances.

Question by Member: In how many cases have you used the catheter preliminary to cystotomy?

Dr. Howard: In only about ten.

Dr. E. G. Crabtree: I feel that I should join the minority in this meeting in expressing approval of Dr. Howard's post-operative treatment in the drainage of prostatics. I have of late not used drainage of any kind except a suprapubic tube for a period of two days after the second step of prostatectomy has been completed. I have done this because I believe it to by a way out of prostatectomy without the peri-urethral abscess formation and epididymitis, two complications most common and trouble some in cases drained by indwelling catheters.

I have done fourteen cases by this method without the development of either peri-urethral abscess or epididymitis. The dates of closure of the wounds on the last eight cases are worth recording.

The best result which I have obtained was that of a man who continued to void at least two-thirds of his urine from his fifth day on. He voided the whole of his urine from his seventh day. One other case voided the whole of his urine from the eleventh day. One from the fourteenth and the remainder within three weeks. I believe a particular point in the operative technique aiming toward earlier closure of the wound where bladder drainage is not used is the use of a small suprapubic incision. I aim not to make the incision longer than two inches, some have been shorter than this. I recognize that in any cases where diverticulum or other complications exist so simple an operation is not feasible.

Question by a Member: Do you drain your cases through the indwelling catheter and sew the bladder up tight?

Dr. Crabtree: No, I leave no drainage in the bladder after a second stage except a suprapubic tube which is allowed to remain two days or a little longer in case there is oozing still continuing. The tube is then removed, sutures left in place and later, when the wound is well granulated, the edges are strapped across with adhesive. I have never had the courage to suture any bladder without drainage after doing a prostatectomy. Bleeding at the time of operation or delayed bleeding may come and produce a very uncomfortable situation.

A vote of thanks was extended to Dr. Keefe and the Providence members.

Meeting adjourned at 10.20 p.m.

## Book Reviews.

*Electrical Treatment.* By Wilfred Harris, M.D., F.R.C.P. Third Edition. New York: William Wood and Company. 1920.

In order to include the new or modified methods of electrical treatment devised during the war, there has been prepared a third edition of this book, "Electrical Treatment." In its main outline and general purpose of presenting a comprehensive view of the various forms of electrical treatment as it is practised today, this edition is similar to previous editions. There have been minor alterations in the text, however, and some additions have been made. Particular attention is given to the work which can be done with faradic and galvanic batteries in the relief of such complaints as acute sciatica, brachial neuritis, and other forms of perineuritis. The theory of various forms of current are explained and methods are considered for the use of faradism, galvanism, sinusoidal and pulsating unidirectional currents, static electricity, high frequency currents, and diathermy. The text is illustrated by figures and diagrams of important electrical instruments. As in the second edition radium therapy was omitted because of its having become a specialty in itself, so in the third edition the details of x-ray treatment are excluded for the same reason. This edition, as were its predecessors, will be found a helpful manual, especially to those practitioners whose only electrical instruments are faradic and galvanic batteries.

*The X-ray Atlas of the Systemic Arteries of the Body.* By H. C. Orrin, O.B.E., F.R.C.S., Ed. New York: William Wood and Company. 1920.

An admirable contribution to the study of anatomy is made available for the use of students of anatomy, surgical anatomy, and operative surgery in this x-ray atlas of the systemic arteries of the body. The book is an adaptation to anatomy of the methods employed by the author in his original work of rendering visible the vascular system by x-ray and has been prepared in response to an appeal made by many who have recognized the value of these anatomical radiographs. It is the purpose of the book to provide a series of natural illustrations of the systemic arteries in continuity, precisely as they exist *in situ* in the undissected body; by this method it is possible to display accurately the complete continuity of the vessels, their exact relationship to bones, their finest terminal branches, and the series of anastomoses into which they enter. A series of stereoscopic radiographs also has been inserted at the end of the Atlas. The following arrangement has been adapted with a view to demonstrating most clearly and completely the continuity of the vessels and the relation of one region to another: (1) head and neck, including the arch of the aorta; (2) upper extremity; (3) thorax; (4) abdomen; (5) pelvis and lower extremity. This is a book of rare excellence and unusual value.

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## REAR ADMIRAL STITT, M.C., U.S.N., SURGEON GENERAL OF THE UNITED STATES NAVY.

The appointment of Rear Admiral E. R. Stitt, Medical Corps, U.S.N., to succeed Surgeon-General W. C. Braistead, Medical Corps, U.S.N., retired, assures an era of professional progress for the medical corps of the United States Navy. Both in this country and in Europe, Admiral Stitt has won the esteem of the profession for his work in the field of bacteriology and tropical diseases, for his success as an educator and his attainments in laboratory research, for his scientific textbooks, his example of devotion to duty, of energy and enthusiasm, and for his high standard of accuracy, integrity and patience in professional work.

Rear Admiral Stitt's primary school and college education was received in South Carolina. He received the degree of A.B. from the University in 1885 and the degree of M.D. from the University of Pennsylvania in 1889. He was commissioned Assistant Surgeon in the United States Navy in 1889 and served on various ships and in hospitals and at shore stations for a number of years. In 1905 he served as medical officer of the Nicaraguan Canal Commission, an appointment which gave him an opportunity to become interested in tropical diseases. In 1902 he was ordered to the United States Naval Medical School as instructor in bacteriology and pathology, and had, in addition, the task of organizing and equipping the chemical and bacteriological laboratories of the school which had just been established in Washington, D. C. In 1905 he studied at the London School of Tropical Medicine, obtaining a diploma with distinction from that school. Later on, he had the opportunity of studying tropical diseases in Egypt and the Orient, serving until the latter part of 1906 at the United States Naval Hospital, Canacao, P.I. Returning to the Naval Medical School, he gave instruction in tropical medicine and directed the laboratories of the school. In 1906, he was ordered to command the United States Naval Hospital, Canacao, P. I., and continued this service for two years, at the same time occupying the chair of Medical Zoölogy in the University of the Philippines. He returned to the United States in 1911 and resumed his teaching at the Naval Medical School, serving, in addition, as president of the Examining Board for medical officers of the Navy. Admiral Stitt lectured at various times on Tropical Medicine at George Washington University, Georgetown University, and at Jefferson Medical College. The degree of LL.D. was conferred on him by the University of South Carolina in 1917 and that of Sc.D. by Jefferson Medical College in 1920. During the recent war he served at the Naval Medical School in preparing the medical officers just entering the service and had charge of the laboratory service of the United States Navy. Admiral Stitt's appointment to his new office is a merited recognition of his faithful and efficient service for many years in the Medical Department of the United States Navy.

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**Influenza in India.**—It has been reported recently that influenza is prevalent in Bombay, Calcutta, Rangoon, and Madras. The Government has adopted precautionary measures and stocks of vaccine are being prepared. Except in Bombay, the outbreaks have not become serious.

## SURGEON-GENERAL CUMMING'S REPORT OF THE PUBLIC HEALTH SERVICE.

In the annual report of the Public Health Service, which has been submitted to Congress by the Secretary of the Treasury, Surgeon-General Cumming has discussed, among many other subjects, the matter of appropriations for new hospitals for war risk insurance patients, immigration and quarantine, situations here and abroad, and the loss of personnel to the Service.

In regard to immigration and disease, he has made the following statements:

"With the cessation of hostilities in Europe and the resumption of maritime commerce, the danger of the introduction of epidemic diseases into the United States increased. During the war, sanitation and public hygiene were more or less neglected. In the countries of Central Europe conditions became very favorable for the outbreak of epidemic diseases, and, in many areas infection of typhus, plague and cholera smouldered along, ready to burst forth under conditions that subsequently were sure to arise. The saving feature of the whole situation was the restriction of travel from one country to another. On the resumption of commercial intercourse the expected happened. Even before the armistice, this condition of affairs was foreseen and medical officers of the Public Health Service were sent to Europe for the purpose of investigation and to make preparation for the application of preventive measures at European ports of departure whenever there should be resumed trans-Atlantic travel. At present, officers of the Public Health Service are stationed at practically all of the important ports of Continental Europe for the purpose of inspecting vessels and personnel prior to their departure for ports of the United States. All verminous persons coming from typhus-infected areas are required to undergo appropriate treatment and detention when necessary before embarkation. Notwithstanding this precaution, however, typhus has broken out on several of the vessels bound for ports of the United States, but, with the detection of the disease on the arrival of the vessel and the appropriate treatment of personnel at quarantine stations, the efforts to prevent the introduction of typhus from Europe has proven entirely successful. Measures in force along the Texas-Mexican border to prevent the introduction of typhus from Mexico into the United States have been equally effective. While typhus would probably never cause such a serious epidemic in the United States, as in other countries, it is by no means improbable that the conditions in the tenement sections of the larger cities would be productive of a serious epidemic of typhus if the infection were introduced into such localities."

Dr. Cumming has made the following statement in regard to the legal status of the Public Health Service:

"It is believed to be of the utmost importance that the legal status of the Public Health Service in its war risk work should be firmly established by placing an administrative head over the three major agencies involved, namely, the War Risk Insurance Bureau, the Federal Board for Vocational Education, and the Public Health Service, and that these three bureaus should operate thereunder as coördinate and independent bureaus in close coöperation."

The question of hospital appropriations has been discussed by Dr. Cumming:

"In October, 1919, the department submitted to Congress a program recommending an appropriation of $85,000,000 for the construction and acquisition of additional facilities to meet the growing needs of the service in connection with the care and treatment of war risk insurance beneficiaries. Congress, in its wisdom, however, deemed it unadvisable to appropriate this money for hospital purposes. Since then, the number of beneficiaries has steadily increased, and recent reports indicate that about 20,000 patients were, on July 1, receiving hospital care from the Public Health Service, as against 2,000 when the request was made.

"In addition to increasing existing facilities by the construction of new hospitals, it is desired to bring to the attention of Congress the dilapidated and unsatisfactory condition of many of the hospitals now owned and operated by the Public Health Service. Some of these hospitals have been owned by the Government for years and were used for the treatment of seamen of the merchant marine and other beneficiaries of the service prior to the act which admitted ex-service men of the recent war as beneficiaries. It is presumed that these institutions will be made use of for years to come for these beneficiaries, despite action which Congress might take with reference to the beneficiaries of the War Risk Insurance Bureau. It is therefore necessary that these institutions be placed in first-class condition. All of the marine hospitals at the present time, with but few exceptions, are of antiquated construction and badly in need of repair. But a few years will elapse before it will be necessary to discontinue entirely the use of these institutions, unless steps are taken to reconstruct and remodel the same to meet with modern ideas of hospital construction and management. Recommendations as to the hospital needs for patients of the Bureau of War Risk Insurance will be presented to Congress in a separate communication.

"The Public Health Service reiterates its firm belief that an adequate hospital construction program should be undertaken by the National Government for the care of ex-service men and women. It is not clear how this responsibility can be adequately met in any other way. It is not believed necessary to go into a very extensive hospital construction program, but certain consideration should be given to a program sufficiently adequate to meet the needs of the situation, and this will mean the expenditure of many millions of dollars. It is repeated that the special needs to be met are those of ex-service men and women suffering from tuberculosis and mental disorders. These groups of patients will require treatment for long periods of time, and their demand is for care and treatment in governmental institutions.

"Despite the temporary increase in compensation granted by Congress during its last session, the Public Health Service, in common with the Medical Corps of the Army and Navy, finds it impossible to secure candidates for admission to the entrance grade of its regular corps, and the attractions offered its scientific personnel are such that the resignations have actually exceeded the admissions during the past 12 months!"

## MEDICAL NOTES.

St. Louis University.—St. Louis University, the oldest seat of learning west of the Mississippi River, has for the first time in its more than a century of endeavor, made a public appeal for funds, the larger portion of which is to be applied to the support of the Colleges of Medicine and Dentistry. The University has asked its alumni and friends to raise the sum of $3,000,000 as a Centennial Endowment Fund, in commemoration of the 100th anniversary of the founding of the institution. The anniversary occurred in 1918, but because of war conditions existing at that time, with over 3,000 of the undergraduates and alumni of the University having answered the call to arms, the celebration was postponed until conditions were more nearly normal. More than fifty per cent. of the faculty and forty-three per cent. of the alumni of the Medical Department of the University held commissions in the Army and Navy at the time the actual centennial date fell.

St. Louis University holds the distinction of having established in the great Louisiana Purchase tract the first colleges of medicine, dentistry, law, and commerce. Its College of Dentistry is the only one in Missouri of Class "A" rating, and together with the Medical College has so expanded that outside aid in the form of an endowment fund is imperative, in order to provide proper salaries for the teaching staff and proper facilities for the two departments. Of the $3,000,000 asked, the income on $1,500,000 is for the salaries of the teaching staffs of the two colleges; the cost of a new laboratory for the School of Medicine is estimated at $250,000; new buildings and clinics for the Schools of Medicine and Dentistry will cost an additional $550,000. The remainder of the $3,000,000 will be applied to the needs of the Institute of Law, School of Commerce and Finance, and the College of Arts and Sciences.

It is hoped by the faculty that old graduates of the Medical and Dental Colleges of the University, who are now scattered all over the world, will appoint themselves a committee of one to aid their Alma Mater to realize the Centennial Fund.

Appointment of Dr. Oscar H. Plant.—Dr. Oscar H. Plant has been appointed professor of materia medica and pharmacology at the University of Iowa, and will become head of the department, to succeed Dr. C. S. Chase. Dr. Chase will remain with the University as full professor and will teach pharmacology and engage in research and writing.

American Physiologists in Paris.—The following physiologists attended the congress held in Paris last July under the presidency of Professor Charles Richet: Professor G. N. Stewart, Western Reserve University; Professor Frederic S. Lee, Columbia University; Professor Graham Lusk, Cornell University; Dr. L. J. Henderson, Harvard University; Professor J. J. R. Macleod, Toronto University, and Professor Fraser Harris, Dalhousie University.

Election of Sir William Macewen.—Announcement has been made of the election of Sir William Macewen as president of the International Society of Surgery, which will hold its next meeting, probably, in London during the summer of 1923.

Medical Appointments at Yale Medical School.—Dr. George Blumer and Dr. Wilder Tileston have been appointed clinical professors of medicine at the Yale Medical School. Dr. Blumer resigned last spring from his position as dean of the School. Dr. Edward H. Hume, dean of the Medical School of Yale-in-China, is on leave of absence in this country and will serve as visiting professor of medicine at the Yale Medical School.

Principal Causes of Death: Summary of Bulletin on Mortality Statistics, 1919.—The Census Bureau's annual bulletin on mortality statistics for the death registration area in continental United States, which will be issued shortly, shows 1,096,446 deaths as having occurred in 1919. This represents a rate of 12.9 per 1,000 population, and is the lowest rate recorded in any year since the establishment of the registration area. The rate for 1919 is in striking contrast with the unusually high rate for 1918 due to the pandemic of influenza, which was 18 per 1,000. This is a drop of 5.1 per 1,000 population.

The death registration area in 1919 comprised 33 states, the District of Columbia and 18 registration cities in non-registration states, with a total estimated population of 85.147,812, or 81.1 per cent. of the estimated population of the United States. The states of Delaware, Florida, and Mississippi were added to the area in 1919 and Nebraska in 1920, so that now the only states not in the area are Alabama, Arizona, Arkansas, Georgia, Idaho, Iowa, Nevada, New Mexico, North Dakota, Oklahoma. South Dakota, Texas, West Virginia and Wyoming. The territory of Hawaii is part of the registration area, but the figures given in this summary relate only to the area in continental United States.

Salvarsan Substitutes. — The inclusion in the program of the All-America conference on the Great Red Plague, which meets in Washington early in December, of a discussion of the use of sundry arsenic "substitutes" for arsphenamine (salvarsan) in the treatment of the plague is highly commended by Surgeon-General H. S. Cumming, of the Public Health Service, who has made the following comments:

"Medical officers of the Service and others concerned, were especially cautioned last spring against the use of arsenic preparations not belonging to the arsphenamine group and were directed to use only the arsphenamine produced by licensed firms under the rules and tests prescribed by the U. S. Public Health Service.

"Testing of these arsenic preparations is very necessary because of their poisonous nature. If not properly prepared, they may be deadly, no matter how carefully they are used, or, what is almost as bad, may be entirely worthless and may delude those who use them with illusory promises of a cure that cannot result.

"Some of the unlicensed preparations that have been foisted on the market were frauds, pure and simple, containing no arsenic or other curative agent at all; but most of these were soon detected and their manufacturers punished. Many of those that are still being made result from efforts to circumvent the rigid tests required by the Public Health Service for the protection of the public and to market substitutes which are sold with unwarranted claims as to their curative value.

"Salvarsan (606) was devised by Ehrlich in 1910, after 605 unsuccessful experiments in trying to find a preparation of arsenic that would kill the germs in the patient's blood without also killing the patient. It was carefully protected by patents, taken out in Germany and elsewhere, that which enabled enormous prices to be charged for it. During the war, inability to import it from Germany, where it was chiefly manufactured, caused the United States to seize the patent rights and to authorize manufacture in this country.

"Later, in an effort to standardize the drug and to prevent the sale of worthless substitutes, the name 'arsphenamine' was adopted; and licenses for its manufacture were granted by the Treasury Department to all persons who complied with certain conditions that were considered essential for safety and health.

"No one who does not comply with these regulations may call his product 'arsphenamine'; but there seems to be no law to prevent the manufacture of substitutes bearing other names and claiming to obtain the same results."

Several firms are now manufacturing arsphenamine and neo-arsphenamine under licenses from the Treasury Department. Their products are rigidly inspected and tested by the U. S. Public Health Service; and these products alone are used in the various hospitals and clinics of the Service.

### BOSTON AND MASSACHUSETTS

The Week's Death Rate.—During the week ending Dec. 25, 1920, the number of deaths reported was 179 against 221 last year, with a rate of 12.48 against 14.47 last year. There were 31 deaths under one year of age against 45 last year.

The number of cases of principal reportable diseases were: Diphtheria, 56; scarlet fever, 30; measles, 36; whooping cough, 18; typhoid fever, 1; tuberculosis, 39.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 5; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 1; scarlet fever, 1; whooping cough, 1; tuberculosis, 12.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 2.

District Nursing Association.—At a recent meeting of the Greater Boston Committee of the Instructive District Nursing Association it was reported that the number of district nursing visits for May, 1920, was 26,552, as against 19,739 in May last year. There were 2,358 new patients during the month of May in this year, compared with 1,570 new patients cared for by the association staff in May of the previous year.

Harvard Infantile Paralysis Commission.—The fund for the work of the Harvard Infantile Paralysis Commission has reached a total amount of $14,755. As about twenty-two per cent. of the six hundred and fifty children reported afflicted with infantile paralysis during the past three months have already gone to the Commission for treatment, further funds are greatly needed in order that this new group, as well as the previous ones, may be assured treatment for the coming year.

Medical Bequests.—By the will of the late Thomas Jefferson Coolidge of Boston, the sum of twenty thousand dollars is bequeathed to the Massachusetts General Hospital. A bequest of an equal sum has been left to the Harvard University to be added to the Thomas Jefferson Coolidge Fund, the income only to be used for research at the Jefferson Physical Laboratory.

Meeting of New England Society of Psychiatry.—On invitation of the superintendent, Dr. Arthur V. Goss, and Trustees, the semi-annual meeting of the New England Society of Psychiatry was held at the Taunton State Hospital, Wednesday, Oct. 27, 1920. The president, Dr. Walter E. Fernald, presided. Program:

1. "Acaraphobia. A Dermatological Psychosis." Dr. Abraham Meyerson, Boston.
2. "Mental Responsibility and Petty Crime." Dr. D. A. Thom, Boston.
3. "Defective Delinquents in the Army of Occupation, or the American Forces in Germany. How They Are Treated in the Disciplinary School."

Lt.-Col. L. Vernon Briggs, M. R. C., U. S. A., Boston.

Seventy members and guests were present. Before the meeting, an invitation was extended to the members to visit the various departments of the institution.

## Correspondence.

### MEDICAL LEGISLATION AND MATERNITY AID.

Deerfield, Mass., Dec. 2, 1920.

*Mr. Editor:—*

When, last January, at our Franklin District meeting in Greenfield, Dr. Worcester quoted one of our leading legislators, Mr. B. Loring Young, as saying that a maternity aid bill was very likely to be passed at that session, I was struck with quite a degree of surprise, knowing something of the hard fight new measures have to go through. Eight years ago I put in a bill for road supervisors for small towns similar to a bill already in effect for school supervisors. This was a matter of economic importance affecting the circulatory life of rural communities which country practitioners can well appreciate. Dr. N. P. Wood of Northfield, who had been in the legislature, and I took a good deal of trouble to go down and argue in its behalf for three winters. Though the bill did not pass, as the Highway Commission argued that under existing legislation they could furnish supervision if called upon, it did emphasize special needs of the small towns and has had a wholesome moral and educational effect. Supplementary legislation has been since obtained for the Highway Commission and small towns have now more practical inducements to avail themselves of such a form of supervision.

Another measure with which I have had to do was stimulated by the dramatic results of fresh-air treatment upon tubercular cases. If this treatment (out door living) is good for the sick, it should add more vigor to the well. I left practice in the city to get more of the outdoors of the country. Conservation, business, sentiment interested me in forestry. Through an experiment I was led to make, I became satisfied that the science of forestry could be made to pay profits in money and, if put more into practice, would furnish an increasing amount of outdoor labor of an interesting kind. I introduced the Mt. Grace Forest measure back in 1914, thinking it would preserve a beauty spot, appeal to the imagination, stand directly for conservation of physical resources and from one viewpoint, at least, in furnishing outdoor employment might serve to a degree for conservation of human health. It has taken *seven years* of hard and persistent work to get this bill through.

It takes *time* to ripen good fruit. Sound legislation must have the continuous coöperation of all interests involved. A maternity aid bill cannot be well matured without the interest, counsel, work and support of the medical profession at large. In provisions for state and community service the medical profession seeks only to have mutual relationships satisfactory.

Sincerely,
Paul W. Goldsbury, M.D.

## A GREETING FROM ST. DUNSTAN'S.

*Mr. Editor:—*

This the season of greetings and gifts.

May I send to your readers greetings and ask them to send me gifts?

These greetings will, I hope, give real pleasure. They convey the gratitude of the soldiers blinded in the war, for the sympathy and help which has come to them from all parts of the world. They carry the news that all we hoped for from the training given at St. Dunstan's is being justified by these blinded men in the very wonderful success that they are making of their lives.

I do not think that anyone would say it gets easier to be bravely blind as the years go on. It becomes easier to do things in the dark, but the demand on the will to keep pace with normal life grows greater rather than lessens. Constant effort is extraordinarily exacting, and it is really splendid how the men meet this demand on themselves, keep up their interest in everything and maintain their notable record as workers; some in offices, some practising as masseurs, some as poultry farmers, and others as expert craftsmen.

There are still more than five hundred men learning to be blind in our class-rooms and workshops.

Besides those actually blinded on the battlefields, 23,000 men were discharged from the army with seriously damaged sight, and, unfortunately, many of these are finding it necessary to come to St. Dunstan's. We are dealing, too, with a number of men whose health does not enable them to make such quick progress as others. At the same time, it becomes increasingly difficult to find for the men who are ready to start on their new life, suitable homes; there is a universal shortage of houses and a great scarcity of such small properties as the poultry farmers need. Thus the difficulty and expense of settling the men has increased while we have to face enormously multiplied costs in providing for those who are our guests, in maintaining our convalescent and holiday homes, and in carrying on the ever-increasingly important work of the after-care of the blinded soldiers.

We have also to meet the expense of moving our headquarters—the offices for the organization required to look after nearly 2,000 men, and also the classrooms and workshops. The house with its beautiful grounds so generously lent by Mr. Otto Kahn as a hostel is no longer available. Fortunately, however, we have been able to find for our new quarters another house in Regent's Park—a place which for several generations has been the London home of the Marquesses of Bute. The interior has been adapted for offices and in the gardens the classrooms and workshops have been re-erected. The place is near the lake on which the blinded soldiers have taken so much pleasure in rowing, and both from the point of view of fresh air and of opportunities for unimpeded exercise, the situation is ideal.

This starting again in the creation of a new training center for the blinded soldiers has, however, been no small matter, and it adds to the reasons already referred to which promps this appeal for the generous help of your readers.

The blinded soldiers have created a magnificent record; the plans for helping them back to normal life have worked out better, I think, than anyone dreamed would be possible. I think, too, there is no one who realizes what the gift of sight means and what blindness must mean, who would not wish to help on this work which St. Dunstan's has undertaken.

I trust that any of your readers who are so generous as to respond to this appeal will forward their contributions to me at St. Dunstan's Headquarters, Regent's Park, London, N. W. 1.

Yours faithfully,
Arthur Pearson, *Chairman,*
Blinded Soldiers' and Sailors'
Care Committee.

## ABDOMINAL MASSAGE AND DR. DROWNE.

Boston, Dec. 4, 1920.

*Mr. Editor:—*

All honor to Dr. Drowne for his courageous departure from the beaten tracks of medicine and surgery, and taking an excursion into the by- (and often forbidden) paths of massage of the abdomen.

His biographers make an unnecessary mystery of his methods, and even insinuate that he kept them to himself. Massage of the abdomen and its variations are simple enough, and fully described in my Treatise on Massage, which Dr. Drowne and his friends seem to be entirely ignorant of. But the results to be obtained thereby are numerous and far-reaching. I have already described many of them in my book, which some of the osteopaths call their Bible, and more revelations await the open-minded investigator. For the present, suffice it to say that the subjective symptoms can almost all be got rid of by means of massage, and, if the disease is not malignant, there need be no hurry about operating.

Dr. Drowne sent me one of his abdominal patients to learn massage, with the expectation that she would be his assistant. When she had finished with me, she said she was not going back to him as she considered what she had learned so very much better than the way she had been treated that she was not going to show it to Dr. Drowne and his assistants. Noble sentiment for a sage from Concord!

Dr Weir Mitchell made his everlasting reputation by the use of general massage in rest cases; Major Thure Brandt, by massage of the pelvic organs in women; Julius Wolff, by massage and exercises in writer's cramp; Mezger of Amsterdam, by massage in joint cases; and now we have the spectacle of the European oculists losing their heads on massage of the eye, claiming results from it that surpass the miracles of Scripture, and saying that they have always been in favor of it, when we know very well that less than twenty-five years ago they could not say enough against it.

Douglas Graham, M.D.

## SOME TIMELY TOPICS.

*Mr. Editor:—*

Several representations have come to me complaining of the undue influence of some insurance companies over some Industrial Accident Boards in the matter of cutting the regular fees of attending physicians, and some other acts outside their sphere. Whenever any member of any such board by word or act seeks to deprive any sick or injured persons of their constitutional right to choose their own physicians or to compel such to submit to the treatment of physicians hired and controlled by insurance companies, thereby letting such companies take them by the throat and preventing them from having any witness of their own, then every physician in such state who is true to his profession and to the interests of the people should at once sign a petition to the Governor for the removal forthwith of such member. If the Governor fails to do so, then see that he and his adherents are retired at the next election. Several victims have told me that when they refused to be throttled by insurance companies and exercised their right to choose their own physicians the insurance companies threatened not to pay them anything and advised the patient not to pay the physician, thereby laying themselves liable for collusion, if not conspiracy, to defraud.

Compulsory health insurance is a Socialistic scheme to deprive and rob the people of their constitutional rights for the benefit of profiteering money interests imported from anarchistic Europe where it has been a failure, and should be deported together with its propagandists. Is the medical profession to be socialized, dominated and its individuality, initiative and usefulness destroyed by any profiteering combinations or their hired politicians? Quite different from the services rendered to the public and the country by the medical profession in both war and peace! Every physician should instruct his clientele forthwith in regard to these matters and arouse them from any unthinking docility. When insurance companies of our state collect from the people over $33,000,000 in one year and pay back to them only $9,000,000, would not the people be better off to have the over $24,000,000 in their own hands or banks rather than in the insurange company's bags?

All citizens of this country, officials or propagandists, who violate the United States Constitution or by fraud or compulsion seek to deprive any loyal citizens of any of their constitutional rights and liberties are traitors and inciters of revolution and should be treated as such, and will be when the people are fully awake—and they are awakening. The king and dictator business, together with the unconstitutional compulsory business is passing, whether existing under the guise of crowned heads, or uncrowned and unscrupulous moneyed combinations, or as mercenary politicians who should never be elected to any office a second time. Physicians will not quietly submit to being robbed by unconstitutional compulsory methods of their clintele, whose confidence and esteem they have won by long years of faithful and efficient service for the people. Nor will the people long submit to being deprived of any of their constitutional rights and liberties by unscrupulous schemers or monomaniacs. In this country all officials are servants of the people, not their masters, and must obey as well as enforce the laws or answer to the people.

EDWIN A. SANBORN, M.D

24 Franklin St., Somerville, Mass.

## Miscellany.

THE next annual meeting of the Massachusetts Medical Society will be held in Boston, Tuesday, May 31, and Wednesday, June 1, 1921.

## RECENT DEATHS.

**DR. ORLANDO B. DOUGLAS** died recently at Concord, New Hampshire, at the age of eighty-four. Dr Douglas specialized in eye, ear and throat diseases. He was associated with many organizations; he had been president and treasurer of the Medical Society of the County of New York, treasurer of the New York Academy of Medicine, member of the New York State Medical Society, the New Hampshire Medical Society, the New Hampshire Surgical Society, the New Hampshire Association of Military Surgeons, and honorary member of the Vermont Medical Society. Dr. Douglas married, in 1864, Miss Mary A. Rust of Orwell, Vermont. After her death he married Miss May L. Mason, in 1875. He is survived by one son, Edwin Rust Douglas of Philadelphia.

**DR. FRANK MARTIN** of Baltimore, Md., died recently. Dr. Martin was a graduate of the University of Maryland. On March 1, 1916, he married Miss Elizabeth Prescott Bigelow of Boston.

The death is announced, at the age of seventy-six years, of **DR. THÉODORE FLOURNOY**, formerly professor of physiology and psychology at the University of Geneva.

**DR. JOHN OLIVER MARBLE**, a retired Fellow of the Massachusetts Medical Society, died at his home in Worcester, at the age of 81. The son of John and Emeline Prescott Marble, he was born in Vassalboro, Me., was graduated from Colby University in 1863, and from the Medical Department of Georgetown University in 1868. He settled in Worcester in 1870 and was one of the medical staff of the Worcester City Hospital for 20 years. He was a director of the Worcester Free Public Library and many clubs. He retired from practice in 1896. His wife, who was Helen M. Allen, died several years ago.

**DR. WORTHINGTON WARNER MINER** of Ware, died at his home December 19, 1920, after an illness of six months. His death was due to anemia. He was born in Ware Nov. 5, 1847, and was the son of Dr. David Worthington Miner and Mary Warner Miner.

He was graduated at Amherst College in 1868, and received the degree of M.D. from the University of Buffalo, N. Y., in 1871. He was for eight years assistant to his uncle, Dr. Julius F. Miner, a surgeon of Buffalo. At the same time he was attending surgeon at the Buffalo Hospital of the Sisters of Charity, and lecturer in the summer course of the University of Buffalo. He was also associate editor of the *Buffalo Medical Journal.*

In 1880 he joined his father, the late Dr. D. W. Miner of Ware. He had been medical examiner of the fourth Hampshire district since 1894. He was surgeon for the Boston & Main Railroad and of the Otis Company, the Gilbert and the Stevens mills at Ware for twenty-five years. He served also as surgeon for the Ware Lumber Company and for the Wood Boot and Shoe Company.

He was a member of the Brookfield Medical Club, the Hampshire District Medical Society, of which he was president in 1908-1909, the Springfield Academy of Medicine, the Massachusetts Medical Society, the New York and New England Association of Railway Surgeons, the Clinical and Surgical Association of Massachusetts, the American Medical Association and the Clinical Congress of Surgeons of North America, and of the Massachusetts Medico-Legal Society. He was on the staff of physicians and surgeons of the Ware Visiting Nurse and Hospital Association.

He held various town offices, that of school physician, chairman of the board of health, member of the school committee and member of the Ware Study Club, the Library Association, the Eden Lodge of Masons, and the King Solomon Chapter of Royal-Arch Masons.

Dr. Miner is survived by two sisters, Miss Jean E. Miner of Ware, and Mrs. Charles A. Tuttle of Middletown, Connecticut, and by one nephew and one niece.

The Boston Medical and Surgical Journal

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## Address

### REMARKS MADE AT THE CLOSING SESSION OF THE INTER-ALLIED SANITARY COMMISSION, PARIS.

By Richard P. Strong, M.D., Boston,

*General Medical Director, League of Red Cross Societies, Geneva; Professor of Tropical Medicine, Harvard Medical School, Boston.*

To an assembly of this nature, the statement will not appear startling (though it may, to some, superfluous), that without the knowledge which the science of preventive medicine has given us, and its application by our medical and sanitary services, the history of the efficiency of the armies of the governments which we represent would undoubtedly have been very different in our recent great war.

When modern scientific hygienic methods are properly carried out, epidemics of infectious diseases (in earlier years often referred to on account of their great severity, as pestilences), no longer decimate armies as they did formerly. Indeed, the glory of preventive medicine in modern times has been in its victories over communicable diseases. The war has given an unusual opportunity for the demonstration of the great progress which has taken place in recent years in the prevention of infectious diseases, and of the excellent results to be obtained when modern sanitary precautions are carefully exercised.

During this recent great conflict, as the reports presented to this Inter-Allied Commission demonstrate, the supervision of water and food supplies and the disposal of refuse of armies was usually looked after with a high degree of efficiency. Gross overcrowding was also generally prevented and widespread and usually efficient action was taken in the allied armies against communicable diseases.

On the other hand, the war has also given some striking examples of the serious results which may follow when, through military exigencies or for other reasons, the enforcement of proper sanitary regulations cannot be carried out. I need only refer, as an example, to the disastrous results which occurred in the army in Serbia in 1915 in connection with the epidemic of typhus, or in the army in Mesopotamia in 1917 in connection with dysentery, typhoid and other preventable diseases.

While influenza during the war has taken its toll, and we cannot upon the whole congratulate ourselves either upon the general enforcement of sanitary measures believed to be of value in the prevention of this disease, or upon the results obtained by their attempted enforcement, it is frightful to contemplate the loss of life which might have occurred had we been without even the preventive knowledge we already possess regarding this disease. Also, in spite of our successes generally in dealing with hygienic problems in armies, and notwithstanding our modern knowledge of preventive medicine, anyone familiar with the principles of public health, who consults for a moment the civil vital statistics of each of the countries we represent, cannot escape from the conclusion that in spite of the efforts of all existing health organizations, there remains in each country—and largely because proper hygienic measures are not taken—a very large and serious amount of preventable disease and of avoidable disablement, and misery, the result of disease; though obviously this amount is very much greater in some countries than in others. Hence at the conclusion of the war Mr. H. P. Davison and those whom he had associated with him in this movement, felt that the time had come for taking steps of greater magnitude against this great mass of preventable disease throughout the world, and of approaching the problem with a wider vision than had hitherto been done; and with the idea of enlisting the services of multitudes of people in many countries in the prevention of disease, and in securing a more unselfish devotion and more liberal sympathy of the people themselves towards public health in cities, as well as in rural communities, and in obtaining their greater coöperation with the national authorities in health activities.

It further appeared that the time was particularly opportune for the Red Cross societies whose war activities had been completed, to inaugurate this movement and to establish an organization which would devote itself to such public health problems.

"The time has more than come," wrote recently one of our distinguished public health administrators, Sir George Newman, "for taking further steps in the organization of a systematic and ordered attack on the strongholds of preventable disease—particularly that mass of crippling morbidity and invalidism which is undermining the capacity and efficiency of the people—an attack which will depend for its achievement upon a close partnership and coöperation between all branches of medicine, between the medical profession and the public, and between the governing authorities and those who are governed. We cannot continue wisely to rely upon piecemeal effort, divided counsels, and conflicting authorities."

The securing of a closer coöperation between the medical profession and the public, and between the governing authorities and those who are governed by the enlistment of the services of millions of enlightened and responsive people in connection with the prevention of disease throughout the world, is one of the fundamental purposes of the organization which I represent, and it is upon the activities of this organization that I have been asked by our honorable President, Professor Santoliquido, to address you.

The League of Red Cross Societies was organized in May, 1919, following a medical conference held at Cannes, and attended by representatives from Great Britain, France, Italy, Japan and the United States. Thus while a number of our most eminent statesmen were engaged at the Peace Conference in Paris in attempting to formulate a plan for a League of Nations destined to bring about and maintain permanent international peace, a number of our most distinguished scientists were assembled at Cannes endeavoring to organize a league for the improvement of health throughout the world and I need not remind an assembly of this nature that health is also one of the prime necessities of life and must go hand in hand with peace in any country if there is to be contentment or prosperity or progress therein. The Cannes Conference heartily approved of the idea of extending the activities of the Red Cross in times of peace for the prevention of disease and the betterment of the health and general welfare of the people in all countries, and expressed the belief that no other organization was so well prepared to undertake these great responsibilities at the present time as the Red Cross.

The League of the Red Cross Societies is a non-political and non-governmental organization. Its objects are: (1) to encourage and promote in every country in the world the establishment and development of a duly authorized voluntary national Red Cross organization, having as purposes the improvement of health, the prevention of disease, and the mitigation of suffering throughout the world, and to secure the coöperation of such organizations for these purposes; (2) to promote the welfare of mankind by furnishing a medium for bringing within the reach of all the peoples the benefits to be derived from present known facts and new contributions to science and medical knowledge and their application; (3) to furnish a medium for coördinating relief work in case of great national or international calamities.

The headquarters of the League are at present located in Geneva and in connection with its program for the improvement of public health and the prevention of disease, a General Medical Department with a director and a staff and an Inter-allied Advisory Council[*] have been established as part of its headquarters in Geneva.

This Medical Department was originally planned to comprise the following divisions: Secretary's Office, Division of Medical Information and Publication, Demonstration Laboratory, Hygienic Museum and Library, as well as Divisions of Child Welfare, Nursing, Miscellaneous Communicable Diseases, Tuberculosis, Venereal Diseases, Malaria, Sanitary Engineering, Industrial Hygiene, and Vital Statistics.

The League has also established coöperative relationships with the Office International d'Hygiène Publique, the only governmental international health body in existence prior to the war, and in this connection our president, Professor Santoliquido, also for many years the president of the Office International d'Hygiène Publique itself, has been appointed as Counselor of International Health to the League, in order that the relationship between these two organizations may be as close as possible.

The League of the Red Cross Societies, however, being a voluntary agency, has quite different functions from the Office International d'Hygiène Publique, and obviously it will not attempt to supplant but will endeavor to aid and to coöperate with this and other Government health organizations and relief agencies.

Recognizing that the prevention of disease and the protection of the health of the people is a primary responsibility and function of Government, it will nevertheless be the policy of the League to encourage wise public health legislation and efficient public health administration by all appropriate means. Thus by effectively mobilizing its millions of members of its constituent national organizations—now numbering thirty-one in various parts of the world—with the object of the prevention of unnecessary sickness, misery and death caused by preventable disease, incalculable results in the betterment of the health and general welfare of the people must be obtained. In this way, in which the education of the people is of great importance, the League of Red Cross Societies may also be extremely useful in obtaining better public support for the work of Government health officials.

In this connection the League has already taken steps to secure copies of all important existing laws and all laws which will be published in the future relating to public health in order that it may be thoroughly familiar with the legislation upon this subject in all of the different countries and be in a position to create public sentiment demanding proper health laws where they are most needed.

Accurate and full registration of vital statistics will be especially urged in all countries as constituting a basis upon which definite and permanent improvement of health conditions may be accomplished. Efforts will be made to secure a standardization of the vital statistics of all those countries where adequate registration and notification are not in effect, so that comparable data on important subjects may be available, and standard tables prepared and submitted for modification and adoption by the authorities in such countries.

The League will endeavor to encourage scientific investigations in hygiene and sanitary science, since progress in the domain of public health depends upon the advancement of knowledge and the application of new principles. In this connection, however, it is not the intention of the League at the present time to organize an extensive laboratory force and to establish a large laboratory of its own exclusively for research purposes. Its attitude in general will be to organize and to encourage and stimulate research work in relation to preventive medicine and hygiene in those excellent scientific institutions already established in different parts of the world, and also to attempt to coördinate national efforts in research, particularly with the idea of obtaining more uniform and correct results in medical investigations regarding which different and conflicting results have been obtained by different workers, or different groups of workers in different countries. It will also, where original investigations appear advisable and of an urgent character, appoint from time to time special commissions for such researches to be prosecuted either in permanent laboratories or in the field. Probably one of the greatest services which the League may render mankind will be accomplished by the undertaking of such investigations of a practicable character, the results of which may be applied later on a large scale by governmental health agencies for the benefit of the people at large.

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[*] The members of the Council are: Belgium, Dr. J. Bordet, Director, Pasteur Institute, Brussels; Denmark, Professor T. H. Madsen, State Serum Institute, Copenhagen; France, Professor Emile Roux, Director of the Pasteur Institute, Paris, Professor Albert Calmette, Sub-Director of the Pasteur Institute, Paris, Dr. Leon Bernard, Professor of Hygiene at the University of Paris; Great Britain, Colonel S. Lyle Cummins, C.M.G., C.B., Professor of Pathology, R.A.M.C. College, London, Sir Walter Fletcher, K.B.E., M.D., Sc.D., Secretary, Medical Research Committee, London, Sir George Newman, K.C.B., M.D., Chief Medical Officer, Ministry of Health; Italy, Professor Dr. Guiseppe Bastianelli, Physician and Pathologist, Polyclinic Hospital, Rome, Professor Aldo Castellani, C.M.G., Professor of Tropical Diseases at London School of Tropical Medicine; Japan, Professor Kinnosuke Miura, Imperial University of Tokio; South America, Dr. Carlos Chagas, Director of the Oswald Cruz Institute, Rio de Janeiro; United States, Dr. William H. Welch, Director of the School of Hygiene and Public Health, Johns Hopkins University, Dr. Hermann M. Biggs, Commissioner of Health, New York State; Dr. Simon Flexner, Director of the Rockefeller Institute for Medical Research. Dr. George C. Shattuck is the General Medical Secretary of the League of Red Cross Societies.

The League also assumes that the establishment of public health laboratories or the provision for laboratory service for every community is an extremely important means of promoting efficient public health administration. Realizing, however, that special training of physicians, both administrative and technical, for public health laboratory work is essential, and that in many countries no provision for such training has been made, it is hoped that there will be established in Europe, preferably in connection with some already existing medical institution, such a laboratory in which a limited number of physicians coming from countries where no such facilities exist, may receive adequate training in public health laboratory work. It is the hope that a number of national Red Cross societies may be prevailed upon to establish a certain number of scholarships each year for physicians to be trained in this manner.

The League believes that the extension of the employment of public health nurses or health visitors should be furthered in every possible manner in all countries, and that standardized educational centers for training such nurses or visitors should be developed. It expects to undertake as soon as practicable efficient propaganda in those countries where trained sick nursing and public health nursing are not as yet developed, and to encourage the establishment of training schools for nurses in such countries. It believes that suitable personnel for instruction both in the care of the sick and public health nursing should be sought and trained, so that such personnel may return subsequently to their own countries qualified to inaugurate and direct movements for the establishment of training schools for nurses. The League will also endeavor, in connection with its constituent societies, to establish a system of scholarships to make it possible for trained nurses to receive the necessary supplementary education to qualify them as public health nurses and as teachers.

With properly trained public health nurses and laboratory diagnosticians, a powerful contribution towards the advancement of public health work in a country will have been accomplished.

The League further believes that educational propaganda has been shown to be the most efficient means for forwarding all forms of health activities, and it therefore will especially urge the general adoption of scientific publicity methods, which include the intelligent use of cinema exhibits, illustrated lectures, and other similar methods of visualizing knowledge. In connection with its educational programme it will also publish a scientific medical journal as well as other scientific and popular literature.

The League believes that the training by thoroughly qualified teachers of school children in all grades in the subjects of personal and general hygiene, and in the inculcation of proper health habits during school life, are essential measures for permanently improving the health and contributing to the welfare of the people.

It believes that special attention should be directed everywhere to the importance of town and city planning, and the proper housing for working men, and suggests that national Red Cross societies promote the erection of buildings to be used as health and community centers in their respective localities.

The League also thoroughly endorses the reports upon child welfare, the control of tuberculosis, malaria and venereal diseases, presented at the Cannes Medical Conference, and urges these programs for adoption in all countries. These reports have been printed by the League and widely circulated, and copies of them are available for any who are interested in these subjects.

Owing to the grave representations presented to the League regarding the wide prevalence of typhus fever in Poland and the danger of its spread westward across Europe, it was decided that the control of this disease should be at once undertaken as an emergency relief measure.

The medical director of the League, after consulting with the Office International d'Hygiène Publique and the British Ministry of Health, recommended that an inter-allied commission be appointed consisting of: General Hugh S. Cumming, U. S. Public Health Service; Dr. George S. Buchanan, British Ministry of Health, and Dr. Aldo Castellani, Italian Navy, all members of this Inter-allied Sanitary Commission; and Dr. Visbecq, Service de Santé, of France, all of whom proceeded to Poland for the purpose of making careful investigations of the medical and sanitary conditions in that country. This commission, upon its return, rendered a report to the League upon the entire sanitary situation, and made recommendations regarding the proper medical and sanitary measures which it considered most advisable to be undertaken.

The League has taken further action in connection with the report of its medical commission and has designated Mr. William C. Boyden (formerly a Harvard overseer) as its commissioner to Poland, and Colonel Henry A. Shaw, M. C., U. S. A., as its medical representative, who with a medical staff are prepared to carry on in connection with the Polish Commissioner an extensive campaign against typhus and other infectious diseases in that country. It is also arranged that Professor S. Burt Wolbach of Harvard University and a staff of seven members, which includes Dr. John L. Todd, Associate Professor of Parasitology at McGill University; Dr. A. Bacot, Entomologist of the Lister Institute, London, and Dr. Frank W. Palfrey, Instructor in Medicine at Harvard University, make thorough investigations regarding the etiology of typhus.

I have endeavored in this statement to point out to you very briefly the general purposes of the Bureau of Public Health of the League of Red Cross Societies, and to touch upon some of the most important lines of activity which it seems at the present time the League may wisely follow. I trust that in this program it will have the heartiest support, not only by the hygienists, but also by the physicians present in this assembly, for as Sir Clifford Allbutt has said recently, "Preventive and curative medicine are but the silver and gold of the two sides of one shield, and education in them is not only the instruction of the apprentice but also the nourishment of the practitioner and the equipment of the pioneer." With the aid of this shield thus welded together, will you not, gentlemen, now that our war activities have ceased, take up this new inter-allied combat against disease throughout the world, and pledge your support to the furtherance of the purposes of this League for the prevention of disease and the mitigation of suffering in the countries you represent?

## Original Articles.

### SCOLIOSIS.

By Herman W. Marshall, M.D., Boston.

Orthopedists have studied scoliosis exhaustively during the past ten or fifteen years, and as each investigator has followed out special phases there have developed such diverging views that they appear contradictory now when each is considered independently.

According to some persons scoliosis should be considered caused by muscle weakness. Others insist on the essential importance of anatomical variations, wedge-shaped vertebrae, anomalies of intervertebral articular processes, and congenital bony peculiarities. A third group of investigators are inclined to lay greatest stress on remote causes that lead to muscular weakness. An appropriate time has arrived therefore perhaps to reconcile conflicting views.

The common type of acquired scoliosis that comes on gradually in normal appearing, rapidly growing individuals, usually during adolescence will be used to introduce desired topics. Lateral curvatures due to shortness of one leg, to empyema, to torticollis, and to primary lesions of the nervous system will be disregarded to large degree.

Characteristics of a typical case of the kind under consideration include lateral curving of the spine into S shaped form, rotation of the vertebrae, to greater or less extent, increased prominence of one shoulder blade, and one hip, and resultant deformities of bones of the chest and of the vertebrae if the process is protracted and severe enough.

Brief survey of established anatomical facts relating to the spine is necessary as a first step to clear understanding of the problem.

#### ANATOMY.

The spinal column is made up of a series of vertebrae united into a single flexible support. This is strong enough to support the body, and

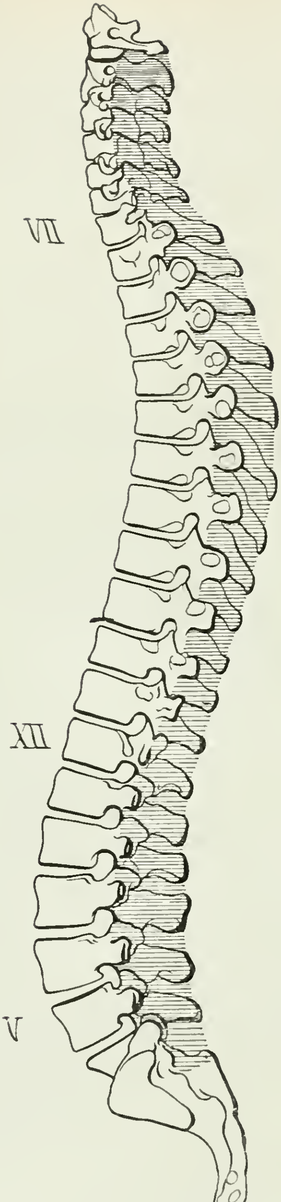

Fig. 1.—Vertebral column, showing location of important intrinsic spinal muscles as shaded area on posterior aspect of the column.

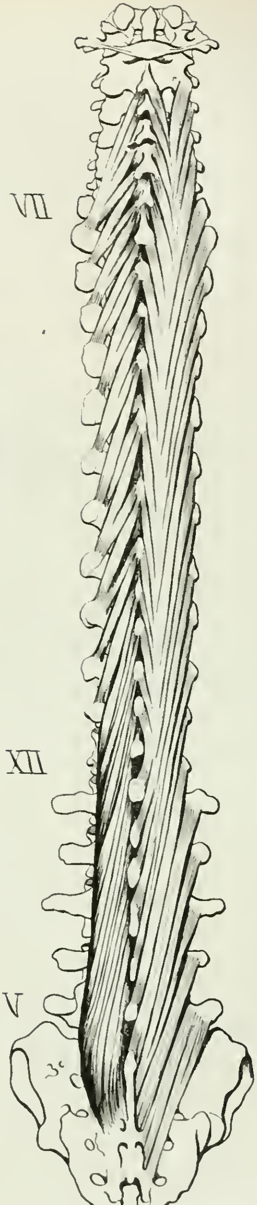

Fig. 2.—Vertebral column, posterior view, showing on right side the deep inner layers of longissimus dorsi muscle attached to lateral processes of lumbar and dorsal vertebrae, but with its important costal attachments omitted. Spinalis dorsi muscle running between lumbar and dorsal spinous processes. On the left side are series of multifidus spinae muscle bundles passing from transverse and articular processes to three or four spinous processes of vertebrae situated just above, and extending in range from sacrum to cervical region.

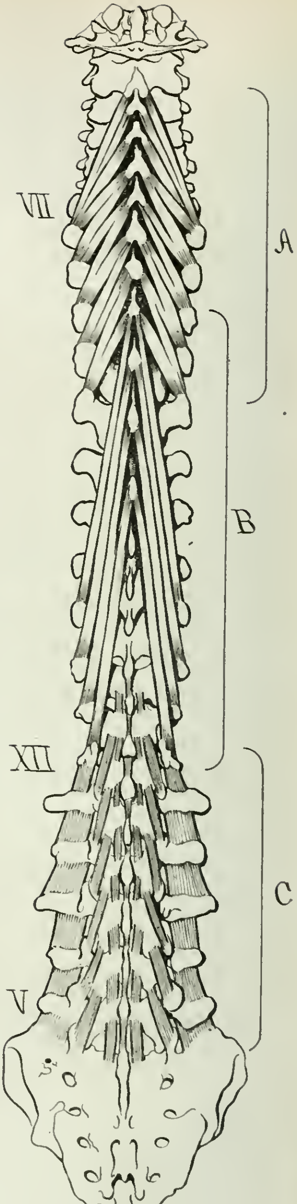

Fig. 3.—Vertebral column, posterior view, showing some deeper intrinsic muscles, intertransversales and interspinales in the lumbar region, semispinalis dorsi in the dorsal region, and multifidus spinae.

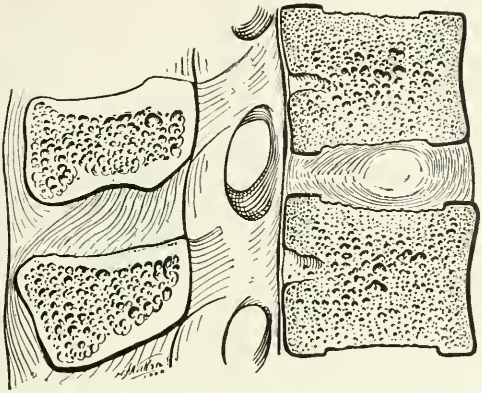

Fig. 4.—Sagittal section of lumbar vertebrae showing the thickness and characteristics of an intervertebral disc, also extreme cancellous nature of vertebral bodies and strong, compact structure of posterior vertebral structures.

yet it can be bent in various directions by strong muscles pulling on it from different parts of the human mechanism through their vertebral attachments.

It serves as base of bony support for head, ribs, arms, and legs, but it should be thought of as a single combination affair composed of a group of bones and of a posterior mass of intrinsic muscles and ligaments as represented in Figures 1, 2, and 3.

Shapes of vertebrae possess significance. The question might be asked what advantages or disadvantages are possessed by existing anatomical developments over simpler design like a column of spool shaped, cylindrical vertebrae bound together with elastic interposed discs. The answer appears in part in the following discussions:

Intervertebral discs are said to make up approximately one-fourth of the length of the spine. Figure 4 shows the structure of a typical intervertebral disc from the lumbar region where discs are well developed. A pulpy center is surrounded by concentric layers of fibro-

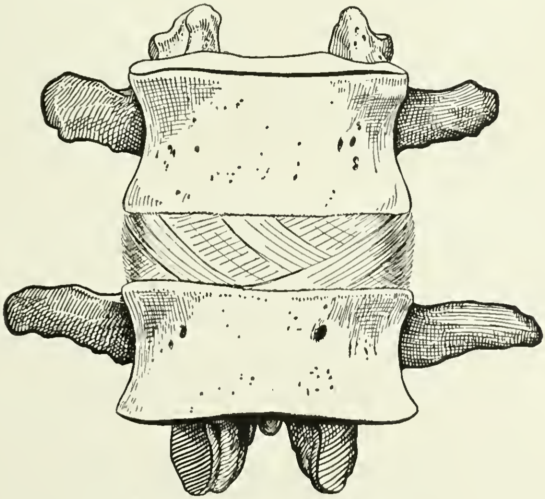

Fig. 5.—Lumbar vertebrae, showing diagonal arrangement of ligamentous fibers which assist in resisting rotary displacements.

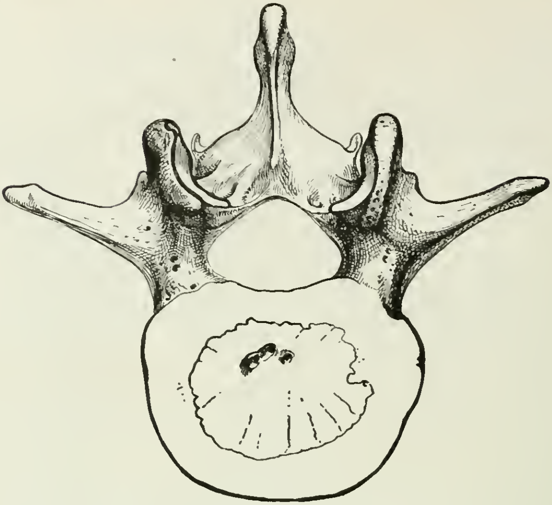

Fig. 6.—Typical lumbar vertebra, superior aspect, showing shapes of articular processes that prevent rotation among vertebrae.

cartilage, and with diagonally arranged ligamentous fibers at the periphery binding together adjacent vertebrae as seen in Figure 5. The contents of an intervertebral space are confined under some tension normally, and when two vertebral bodies are cut apart through the intervening space there is a slight outward bulging of the soft central cartilage. Elasticity of the cartilage permits slight changes in relationships between adjoining bony parts yet the latter are held in fair alignment. Elasticity of the intervertebral discs also helps in pushing back the vertebrae into their previous relationships when outside muscle tension or pressure of body weight is released. In this task intervertebral disks are assisted by elastic ligaments of posterior regions of the spine that have been stretched in spinal movements.

Egg shell thinness of the outer bony layers of cancellous vertebral bodies is very accurately drawn from actual specimens in Fig. 4 and should be compared with compact, strong osseous structures of posterior regions of the vertebral column. It is easy to understand from such a section why vertebral bodies become deformed under pressures or crush readily in severe injuries.

Intervertebral articular processes limit motions of the spine from their shapes and positions. Figure 6 shows the superior aspect of a typical lumbar vertebra with its superior articular processes. The surfaces of the latter are sections of cylinders, and when its body is firmly adherent to the superimposed vertebral body obviously rotary movements between the two vertebrae will be restricted largely by the interlocked processes. Both articular processes can slip up and down, however, in forward or backward bending, or members of the series on one side can be tilted in lateral movements of the lumbar spine. Elasticity in thick intervertebral discs permits slight rotary tendencies, however, which can be increased still further when intervertebral articular processes are partly unlocked in flexed positions of the spine.

Figure 7 shows the superior aspect of a typical dorsal vertebra with its superior articular surfaces set at an angle, but with their plane surfaces so arranged that they do not offer much bony resistance to rotary twisting of adjacent vertebrae.

Intrinsic vertebral muscles are of value in holding together or pulling back separate vertebrae into exactly normal positions after the latter have been subjected to outside strains that pull unevenly and locally on different parts of the column. Each lumbar intervertebral articulation is the point of insertion of slips of multifidus spinae muscles. These slips pass toward the median line to be inserted into spinous processes of the three or four vertebrae just above. Figure 2, left side of median line.

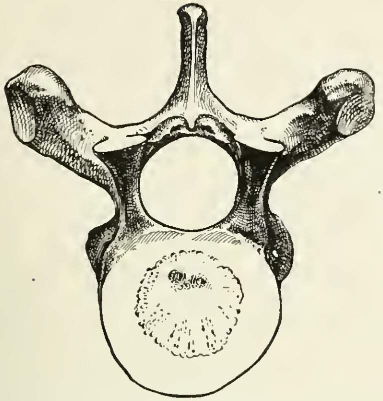

Fig. 7.—Typical dorsal vertebra, superior aspect, showing shapes of articular processes with plane surfaces that do not present much bony obstruction to rotations among vertebrae.

Contractions of these short intrinsic rotators of the spine produce perfect readjustments of intervertebral articulations within their loose capsular ligaments as well as assisting in holding or replacing alignments of spinous processes. There are present in the lumbar region short interspinous muscles that supplement actions of elastic interspinous ligaments while short intertransverse muscles act between adjacent transverse lumbar processes. Figure 3.

Dorsal intrinsic spinal muscles include other members of the series of multifidus spinae, and they pass from transverse processes to spinous processes instead of articular to spinous processes as in the lumbar region. Also there are small variable rotatores spinae passing from transverse processes to laminae beneath overlying multifidus spinae bundles.

Longitudinally arranged intrinsic muscles bridge larger groups of vertebrae, and help to hold straight alignment or straighten lateral bowing of the column. They connect the sacrum with transverse dorsal vertebral processes as well as with transverse and articular lumbar processes by deep inner fibers of longissimus dorsi muscles. Spinalis dorsi muscles connect upper lumbar spinous processes with spinous processes of dorsal vertebrae. (Figure 2.) Semispinalis dorsi muscles run from transverse processes of the lower dorsal vertebrae to spinous processes of the upper dorsal and lower cervical vertebrae. Figure 3.

The combined action of all intrinsic muscles of the spine when acting in normal physiologic manner is to maintain the original bilateral foetal symmetry of the spine as it developed, and with evenly balanced continuous muscle tensions on the two sides of the column.

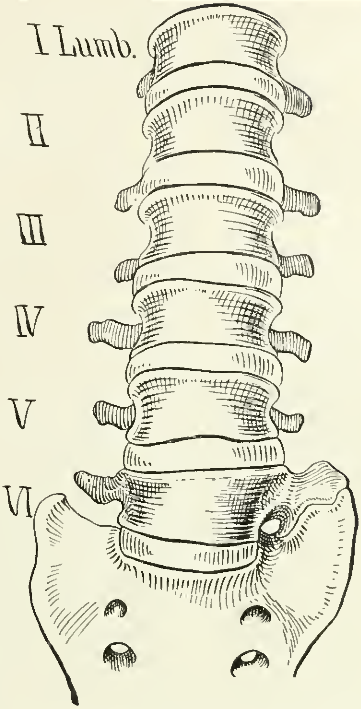

Fig. 8.—Bony variations of the lumbo-sacral spine.

It will be seen, also, from Figures 1, 2, and 3, how the elastic mass of muscles with their numerous attachments and different directions of pull can control accurately the intimate relationships between component bones of the spine.

### VARIATIONS OF VERTEBRAE AND MUSCLES.

Anatomical studies have revealed innumerable bony variations of the spine. There are variations in numbers of cervical, dorsal, lumbar, and sacral vertebrae. There are irregularities of formation in vertebral bodies, transverse processes, laminae, spinous processes, and articular processes. X-rays show that these various anomalies exist frequently in persons who have approximately straight spines of good strength and normal function.

There exist at times unusual wedge shaped vertebrae. The transverse processes of lowest lumbar vertebrae may fuse with the superior surface of the sacrum. Transverse lumbar vertebral processes may vary among different lumbar vertebrae and between the two sides of the same vertebra. Failures in development of laminae and spinous processes result in variable degrees of spina bifida. Articular lumbar processes may vary among different lumbar vertebrae and between the two sides of the same vertebra.

The weight of evidence leaves no doubt as to the great frequency of unilateral character of many bony variations of lower regions of spines. Figure 8 was drawn carefully from an actual specimen and illustrates some of these peculiarities.

Particular emphasis should be laid on the unilateral spinal variations and these are readily understood from embryological developments.

It will be remembered that cartilaginous tissue develops in the foetus about the course of the notochord, and the remnants of the latter are represented perhaps in the pulpy centers of intervertebral discs. This dorsal cartilaginous mass ultimately is split up, then ossified, to make the necessary number of vertebrae, but occasionally a few more or less than the usual number of segments are divided off, and lines of cleavage also may not run squarely across the dorsal cartilaginous mass in all instances. As a result there are some wedge shaped vertebrae. This is possible and the spine may retain straight alignment of its component irregular parts. In other instances apparently, there are congenital structural variations that make it assume more or less deformed positions.

It will be recalled that lateral folds grow up on each side of the neural canal, and finally completely surround it, fusing together where they meet in the median plane of the body posteriorly. In them are formed vertebral processes with their attached intrinsic muscles.

Fusion of these lateral folds is not complete in cases of spina bifida which represent failures of perfect development of lateral folds or neural arches. And unilateral bony variations of the lower region of the spine indicate without doubt some unilateral differences of development between homologous parts on the two sides of the growing foetus. Occasionally these unilateral bony variations are of decided degree and indicate marked original foetal asymmetry.

Intrinsic muscles of the spine of the lumbar region necessarily must show variations roughly corresponding to bony variations. In spines with four lumbar vertebrae there will not be as many muscle attachments provided as in spines with six or seven lumbar vertebrae as has been recorded. Muscles have to accommodate themselves to the unusual conditions if they, too, have not varied precisely as vertebrae have varied. Corresponding with unilateral bony anomalies presumably there are unilateral variations in development of spinal muscles although the latter are difficult to identify.

Anatomists have proved by direct observation that there are numerous variations among the small muscles of the spine, and undoubtedly many more of them have not been recorded. This is so on account of the important physiological power of muscles to hypertrophy and changes their size and strength in response to increased work, whereas bony variations remain relatively fixed and constant, and easy of recognition.

All evidence obtainable favors the view that frequent congenital anomalies of spinal muscles as well as congenital spinal bony anomalies occur, although they do not vary in identical manner.

### TIME OF ONSET OF SCOLIOSIS.

Awkward, newly born, flat backed, flat footed infants still face important stages of normal development during which final adjustments of muscles of the body take place with establishment of normal muscle balances.

An infant soon learns to poise its head and move its arms, then to sit up, to creep, to stand, and finally to walk. During this gradual process there are steady hypertrophic physiological changes going on in various muscles that were congenitally smaller and weaker than muscles to which they will be naturally opposed during life. Sooner or later perfect muscle balances for all muscles are attained, and movements made clumsily and inaccurately at first become more skillful and rapid as muscle balances become more and more firmly stabilized. Greater congenital differences between physiologically opposed muscle sets require longer times for final adjustments and equalizations of strengths than do more evenly developed muscle groups. Hence, in part, the variable lengths of time noted before different infants learn to walk and balance themselves.

Physiologically opposed sets of muscles located on each side of the spine, serving to rotate vertebrae and assisting in maintenance of bilateral symmetry, are subject to same developmental laws as govern final adjustments of all other muscles. Hypertrophic muscle changes take place in the congenitally poorly developed side until muscles on the two sides of the spine are of the same strength. Inherent weaknesses due to congenital underdevelopment are thus obscured yet still remain latent within the muscles to reappear in certain instances later in life. The majority of persons, however, are not troubled further and their spines remain symmetrical in spite of latent differences of muscle strengths.

Occasionally congenital differences between opposed sets of spinal rotators are so great that final adjustments immediately following birth are never perfectly completed in symmetrical fashion, and such infants are congenital scoliotics of muscular origin in contradistinction to congenital scoliosis due to unbalanced bony variations of vertebrae.

There will be a certain number of persons in whom normal bilateral symmetry is attained at the expense of the utmost exertions of the weaker set in the muscle balance, and when the period of rapid growth occurs about the time of adolescence there is a lagging behind in growth of congenitally poorly developed members that have nearly exhausted their reserve powers of growth already. The more rapidly increasing strength of their physiological opponents slowly begins to pull the vertebrae into typical scoliotic deformity.

When the period of rapid growth has passed the weaker muscles may catch up gradually by continued growth until more perfect muscle balance is regained. Bony deformities persist, however, that developed in soft growing bones while the latter were held in deformed positions for years and finally were fixed by ossification processes.

It is possible for a person at middle life to have a moderately deformed scoliotic back that is strong and symptomless, similarly as there may be moderate deformities of the feet and yet the individual possess strong symptomless flat foot.

Acquired scoliosis may develop when unilaterally congenitally poorly-formed, weakly-resistant members of the muscle balance succumb more quickly to harmful vascular conditions than do the stronger, better developed members of the bilaterally symmetrical balance. Onset of scoliosis in this instance is timed by the appearance of vascular defects which destroy muscle balances temporarily.

Vascular defects occur very commonly during adolescence and aggravate the progress of scoliosis that has been initiated by differences in rates of growth among bilaterally opposed congenitally differing muscles. However, there may be rapid undermining of muscle strengths of stabilized scoliotic spines at middle age from temporary very faulty blood conditions, and in these cases new symptoms developing are attributed erroneously to the obvious spinal deformity while real hidden causes for symptoms exist untreated often in the blood. Such patients are subjected to unnecessary corrective treatments for their stabilized structural spinal curves.

Acquired scoliosis develops after infantile paralysis at times from loss of symmetrical muscle balance on the two sides of the spine from this cause. There is a tendency among some orthopedists at present to assume many cases of scoliosis are due to unrecognized mild cases of infantile paralysis but the writer believes these can be satisfactorily explained as unrecognized congenital unilateral muscular variations. Such explanation seems preferable to wide acceptance of unwarranted suppositions of failures of diagnosis in such a definite disease as infantile paralysis.

## BALANCED AND UNBALANCED BONY VARIATIONS OF VERTEBRAE.

Figure 8 shows balanced or compensated variations among bones of the lumbar spine, and straight vertebral alignment is not interfered with. A slightly wedge-shaped vertebra is compensated by an adjacent second wedge-shaped vertebra with the base of the wedge on the opposite side of the spine from the first one.

There may be variations in development between two corresponding intervertebral articulations on the two sides of the spine, and yet one series of articulations as a whole may equally balance the series of the opposite side, although individual peculiarities occur on both sides of the spine among the entire lot. There is shown in Figure 8 unusual cleavage and asymmetry of the sacrum.

Compensated bony variations possess no practical significance usually as is demonstrated by x-rays of many individuals possessing such variations.

Best examples of unbalanced vertebral variations are seen in late bony deformities resulting from scoliosis of muscular origin. If all muscle tension were removed, such spines would continue to remain in deformed positions, and these deformities act as causes for continuance of future deformity, while simultaneously representing results of previous causes that have already acted.

There has been collected evidence that marked unbalanced vertebral variations do exist occasionally, dating from irregularities of foetal bony development, that must be assumed to be causes for a few cases of congenital scoliosis. There are very many instances of extremely slight degrees of bilateral spinal asymmetry presumably if differences are measured by micrometer but these instances are ignored in the present connection.

Over-developed or under-developed equally balanced sets of muscles have little significance in development of scoliosis; but strong, over-developed sets presumably are important factors in flattening out bony differences. For unbalanced symmetrical bony variations of vertebrae would have to be extremely well marked to produce permanent lateral spinal curvatures if strong even muscle balances were acting naturally to produce normal bilaterally symmetrical development. Bones probably gradually adapt themselves to straight alignment in spite of their irregularities, similarly as evenly developed bones slowly become deformed to striking degrees under the continuous influence of uneven muscle balances.

### VARIABLE STABILITIES OF MUSCLE BALANCES.

Discussion has centered thus far about lowest normal limits of balances between bilaterally symmetrical, physiologically opposed muscle groups. There should be recognition that each physiologically opposed muscle set possesses a variable range of stability with maximum as well as minimum normal limits.

If both members of the balance are represented by large, strong, well-formed muscles that have developed very evenly on the two sides of the spine in foetal life, then there will be large reserve powers of functional adaptability existing on both sides of their resultant very stable balance. Under these circumstances any new factor, such as a faulty twisted posture maintained at times by school children sitting for protracted periods at their desks, will not disturb the normal muscle balance visibly although reserve stabliity will be diminished slowly.

On the other hand, if both members of the balance are represented by very small muscles that have developed also rather unevenly on the two sides of the spine in foetal life, with partial exhaustion of reserve powers of one of the members in adjustment of final balance immediately following birth, the necessary hypertrophy for maintenance of normal bilateral symmetry, there will be resultant extremely delicate normal muscle balance that can be easily upset.

There are many degrees of stability of balance possible theoretically between these two high and low normal limits, yet latent reserve powers of balanced muscle groups can not be proved or disproved directly in satisfactory manner by scientific experiments.

When stabilities of muscle balances are delicate, trivial factors may swing the balance of equilibrium at such times either in favorable or unfavorable directions. It is conceivable that the faulty twisted posture of a school child may be the last straw to upset normal conditions, or if the twisting occurs in the opposite direction in a manner to relieve weakening muscles to trifling degree then it can be considered theoretically as a favorable influence.

Very slight vertebral variations possibly may possess some practical significance under these exceptional conditions, but it should be noted that destruction of normal muscle balances is the final step that determines the onset of developing deformities, and that rapid rates of growth, changes of vascular conditions, vertebral anomalies and occupational postural peculiarities are contributing factors always in the final upsetting of muscle balances.

### NATURE OF VASCULAR DEFECTS THAT UPSET MUSCLE BALANCES.

The blood stream is a sewage system as well as a food supply for the tissues. It contains useful and useless substances and each of these vary from time to time to greater or less degree. The influence of circulating blood on the muscles therefore is always a mixed one. They are benefited in variable degrees by shifting proportions of useful substances. In rapidly growing children food materials are quickly appropriated by the tissues so there may be slight deficiencies of useful substances in circulation if the diet is faulty. On the other hand, as food substances diminish there are relative increments in proportion of useless waste products. Harmless waste products may assume mildly deleterious properties toward muscles if they rise above certain unknown limits.

It will be seen that vascular influences on tissues are essentially matters of complex balances among numerous constituents of the blood. Foreign substances occasionally obtain entrance to the blood stream and in extremely minute quantities they may possess greater toxic properties than large excesses of useless normal waste products.

Vascular defects are frequently of comparatively brief duration, and congenitally poorly resistant muscles succumb for a while to unfavorable vascular balances, then are restored in strength gradually as a more beneficial vascular equilibrium is reëstablished. Vascular defects account for many slight scoliotic curves probably, that appear and then disappear again soon under appropriate medical care. Vascular defects are readily overlooked and if increase of scoliosis occurs with increased back weakness, there is likelihood that spinal curves will be attacked with renewed vigor without corrections of more important contributory causes for the scoliosis in circulatng blood.

### MUSCLES INVOLVED IN SCOLIOSIS.

Latent muscular peculiarities cannot be identified by examinations of equal sized muscles of equal strength, and so the only criteria that can be utilized in estimating probable muscular involvements are peculiarities of individual scoliotic curves, amounts of rotation of vertebrae, degrees of S shaped spinal deformity, and x-ray peculiarities.

Suspicion fixes itself prominently on multifidus spinae muscles and on longissimus dorsi muscles, but presumably there are different degrees of involvement in many muscles intimately associated with maintenance of spinal integrity. There is no positive way of identifying which muscles show greatest congenital peculiarities and probably each individual case presents individual minor variations.

### TREATMENT OF SCOLIOSIS.

Adequate discussion of treatment of scoliosis would require a long separate paper. Some patients are confined now in heavy corrective jackets. Some have been subjected to operations whose object is the fusion of spinous processes of lumbar and dorsal vertebrae into a continuous bony mass. Others are treated with special exercises for long periods, a few have special attention paid to corrections of their vascular defects, and many are taught the dangers of faulty postures.

It is the writer's belief that existing methods are used not infrequently in a manner that may increase rather than diminish scoliotic tendencies, and that greatest promise for increased efficiency in treatment in the future lies in better understandings of natures of scoliosis that permit more skillful use of methods already in use.

While great advantages of special skill in use of special methods should be recognized fully, yet these advantages have to be weighed carefully, against the limited physiologic scope of special methods and imperfect understandings of entire problems. The latter may lead to use of excellent measures at inappropriate times with resultant diminished efficiency as viewed from patients' standpoints although great special skill may have been shown.

### CONCLUSIONS.

1. Acquired scoliosis developing in normal appearing, rapidly growing young patients who have no history of past anterior poliomyelitis is due primarily to unilateral congenital differences in development of spinal muscles. The onset of scoliosis is determined commonly by a lagging behind in growth and strength of the more poorly developed members in physiologically balanced, bilaterally symmetrical sets of muscles at their period of most rapid growth in adolescence.

2. Faulty blood conditions acting on unilaterally congenitally defective spinal muscles also are contributing causes frequently in developments of acquired scoliosis. Such congenitally defective muscles weaken more rapidly under the influence of faulty blood supply than homologous muscles on the opposite side of the spine, and a defective scoliotic balance develops as a result. Acquired scoliosis of vascular origin is likely to be of brief duration often because vascular defects are quickly corrected very frequently.

3. Congenital scoliosis is due at times to very marked congenital differences between homolo-

gous members of balanced spinal muscles. Differences are of such degree that normal establishment of physiological balance between them becomes impossible immediately after birth as usually takes place by hypertrophic muscular readjustments among less widely differing sets.

4. Congenital scoliosis is due at times to uncompensated congenital structural variations of vertebrae.

5. Marked congenital scoliosis is due presumably at times to combinations of slight congenital unilateral differences in muscles with slight congenital uncompensated variations in vertebrae.

6. Marked acquired scoliosis is due presumably at times to equal combinations of several contributory factors acting together to destroy muscle balance.

7. Compensated vertebral variations are of very minor importance in development of scoliosis.

8. Occupational factors act as contributory causes in development of acquired scoliosis.

9. Other contributory causes for spinal lateral curvatures are found in muscle paralysis following anterior poliomyelitis, contractures after empyema, diseases of hip joints that produce unilateral shortening of the legs, torticollis, and the malnutrition of rachitis.

10. Stabilities of physiological balances between opposed members of sets of spinal muscles exhibit variable ranges with low and high limits that permit normal bilaterally symmetrical posture. When low limits of normal muscle balance are passed spinal deformity makes its appearance, and when upper limits of stability are approached spinal deformity is very difficult to produce, as when congenital developments are equal on the two sides of the spine in balanced muscles of exceptionally large size and strength.

11. This complete conception of scoliosis if applied in practice will modify prescriptions of special treatments to important degrees and may lead to increased efficiency in management of cases.

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ELECTION OF DR. JOHN S. DEAVER.—Dr. John S. Deaver of Philadelphia has been elected president of the American College of Surgeons, to succeed Dr. George E. Armstrong of Montreal

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# THE NECESSITY OF MAINTAINING PROPER STANDARDS OF NURSING CARE.[*]

By ELISHA H. COHOON, M.D., MEDFIELD, MASS.

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CIVILIZATION connotes change and progress. Advance in civilization can always be measured or determined by the character of the concepts of the individual regarding his relations to others as well as to himself. Whether these relations and inter-relations are particularly concerned with matters of a physical, moral, economic, or spiritual nature, they all will reduce themselves in the end to a fundamental basis, namely, the individual's attitude or relation to his physical *me*, his social *me*, and his spiritual *me*.

The history of civilization unfortunately does not show that advances have always been constant or that progress has always been made along the best and most definite lines. Although convinced that civilization is evolutionary we are forced to admit that in its course are found periods of stasis and even regressions, and that many of the concomitant changes are as liable to be caused or accompanied by violence as by orderly measures based upon reason and the experience of others. The greatest advance has been in the realm of social relationships and we actually progress in civilization as we develop broad social instincts. The period comprising the last century, characterized by great advances in the arts and sciences, has also been characterized by the practical application of the obligations and duties of the individual to his fellow man, not only as it relates to personal contact, but to the community at large, and to the whole human race. The late world war, despite its interpretation by many as being an evidence of a set back for civilization, has been productive of placing before us as never before the importance of our social inter-relationships and particularly the necessity for assistance to others, and the fact that to aid one another is both an individual and a national duty. Of the many things learned as a result of the war none has been of more importance than the appreciation that a nation and a people can be successful and can develop only as their minds and bodies are taken care of and protected, and it has been demonstrated especially that the prevention of disease and the carrying out of the general precepts of health are the great factors in the program for development.

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[*] Read at the graduating exercises of the Boston State Hospital Training School for Nurses, June 25, 1920.

The history of nursing goes back to the beginning of the history of civilization and in a way we find the course of nursing more or less conforming to the general changes and fluctuating course that has marked civilization. The benefits of intelligent care, particularly for the physically ill, have always been appreciated, to some extent, by all peoples, but there has never been anything further than a relative comprehension of the scope of the field of nursing or of its actual benefits. Previous to the last century, efforts at organized nursing were carried on usually by independent and unrelated bodies and societies, or by religious orders representing the various churches, and in Christian countries it is to the credit of the churches that the spirit of nursing was kept alive through periods of varying degrees of darkness. It can rather be concluded, at least in some instances, that the motive of those entering upon this work was largely based upon the idea of a spiritual reward, but it cannot be charged that service to the individual and to the community was disregarded. The changes naturally resulting from the new spirit introduced by Florence Nightingale, although constituting a marked advance, only partially presented the importance of nursing from its broad aspect and only defined to a limited extent what we now believe to be the true ideal of the nursing profession.

In the last half century there has been marked progress. Training schools have been introduced into practically all hospitals and the courses have not only become lengthened but have been made more practical. This progress, although on the whole sure and steady, showed the marks of the influence here and there of the public's sentimental attitude toward the care of the sick in general and especially as it related to hospitals. Some who became applicants for the training schools made the decision because they felt they had certain powers "to cool the fevered brow" and to heal the sick and as a result would be regarded in the light of the ministering angel, while others entered gaily into this work of hardship feeling it was the fashionable thing to do. As time went on, naturally, this particular element of sentimentality to a considerable extent disappeared and was replaced by the more practical reason for entering a training school, namely, that it provided a splendid vocation for certain types of young women. The demands for more scientific and better training resulted in another change and nursing gradually came to be looked upon less as a vocation and more as a profession, and so conforming with the general trend of the times I believe we can see the growth of nursing from a vocation requiring a certain amount of education and proficiency in the care of the sick, to a profession, the requirements of which demand a good preparatory education and the acquiring of considerable scientific knowledge. On the whole, its development has been along lines of intelligent progress. Associations have been formed and much literature has been contributed by nurses to the various magazines or organs managed by their National and State associations. The whole result has been one great achievement and at the present time nursing presents itself as one of the important, if not the most important, of all professions. When we take into consideration the handicaps, the character of the work, the long hours, the amount of study, the rigid training, the privations, small remunerations and the service given, our respect for the nurse and for the nursing profession should be greatly increased. As time went on and the courses for the training schools were lengthened and the preliminary educational requirements were raised it became more and more difficult to become a graduate nurse. The late World War has presented to us the importance of nursing as it has never been understood or appreciated before. The part that the nurses played, both abroad and in this country, cannot only not be given too great praise and too much appreciation but has placed the profession in a position that not only demands respect but has caused it to be considered a great and necessary factor for the proper defense and life of the nation.

As the community came to realize the value of the nurses' work so have the demands for the nurse increased. No longer do we conceive the function of the nurse to be restricted to the care of patients in the hospitals and in the private homes. New fields for operation of the nurses' function have already been recognized and the future promises more new fields to be opened and a general enlargement of the nurses' sphere. The public health nurse, the district nurse, the factory nurse, the school nurse, the Red Cross nurse, the army nurse, and the nurse specialized in other fields are not only at present in great demand but have been so for some years and the demands along these lines are increasing every year. The future can only be predicated on a basis of experience and present trends. I believe it can be rightly assumed that the call and need for nurses will not only be for greater work along these particular lines but will come from unthought of sources and angles. The field of prophylaxis, or the prevention of disease, is only beginning to be opened up and the time seems to be ripe for great development. Undoubtedly for a comparatively long period of time the development of this branch of medicine will demand the employment and coöperation of specialized nursing. In the war for the prevention of disease in general and especially against the invasions of epidemics, the nurse will have to play the part of the day and night outpost as well as the real front and rear line defender.

The education of the nation is about to undergo radical changes. So far it has rather been limited to the teaching of languages and the fundamentals of the arts and sciences, overlooking that large territory in which lies the health, both mental and physical, of the child, the youth and the adult. I believe that the hope for future generations and the nation's best welfare depends upon the conception of the aims and methods of education as they will apply to the practical training of the child, the youth, and the adult, from standpoints of physical, mental, and moral health. If this new development in the field of education should take place, and I have no doubt of it, it can only be successfully accomplished with the aid of the scientist, the physician, and the nurse, the latter probably playing the greatest and most important rôle. All of this will, of course, by increasing the demands require not only more highly trained and more highly specialized nurses but will require a much greater number. As the preliminary requirements have been increased, as the standards of the training course have been raised, as the new fields have opened and in general the demands have increased, the inevitable has occurred, that is, that even at the present time the demand has become greater than the supply. To be true, the war, special economic conditions, lessened immigration, and other factors have all assisted in decreasing the supply. The situation at the present time is both acute and grave and the future holds out little hope unless steps are taken to somehow remedy this condition.

It would seem that we are about to enter upon a new epoch in the history of nursing and that now is the opportune time to take stock, to develop new ideas, to formulate new plans and arrange for new programs not only to meet the requirements of the present but to provide for the necessities of the future. How is the nursing profession and all others who are interested in and appreciate this condition going to meet the situation? How are we to meet these new requirements and at the same time increase the numbers? The field of usefulness of this work is not and cannot be restricted to the part to be played by the specialized and scientific nurse. Usual nursing care of high grade character must still be rendered to the patient in the hospital, to the patient in the private home, and especially in the homes of that class of citizens who do not care to accept charity but whose resources will not permit the employment of a scientific, highly specialized nurse. Current literature in nursing magazines indicates that the nursing profession are alive to this situation and are attempting to work out a solution. So far as can be learned, with one or two exceptions, the plans that have been suggested in several states are about as follows: To increase the requirements and standards for the graduate nurse and to supplement the deficiency in numbers that will inevitably occur, as did occur under like conditions in the medical profession, by the introduction of a new element into the nursing field, namely the trained and licensed attendant. The bills that have been introduced into the legislatures of two states, at least supported by some of the leaders of the nursing associations as well as by interested parties of laymen and laywomen provide for the licensed attendants to receive a nine months' training in a hospital, sanatorium or association. The proponents of the various bills for licensing attendants state that the licensed attendant can take care of the ordinary sick person in the home and will also be able to do a certain part of the nursing work in the hospitals. On the surface, this would seem to be a practical solution of this question, but examination into it by some leads to the conviction that the very object sought will not be attained, and that it may be the means of the introduction of an inferior element into the nursing field with results correspondingly disastrous.

In the first place, the requirements as set forth for the licensed attendant do not include any preliminary education and a rather indefinite and vague training of nine months, and yet they are expected to take over a considerable portion of nursing work which up to this time it was felt could be done only by those who had taken at least two or more years of good hospital training. If this were to be considered in the light of an emergency or an expediency it could perhaps be excused, but with the trend and the necessity for raising the standards of the trained nurse, the inevitable lessening in the number of graduates and applicants for the training schools, will not the amount of this nursing work to be turned over to the licensed attendant increase and become more complicated?

Secondly, have we a right to conclude or even assume that there will be a rush of applicants to the hospitals, sanatoria, and associations for the degree of licensed attendant? What stimulus will there be even for the poorly prepared female to attain a degree of such an inferior rank and under a new name, to do the work hitherto done by the nurse? My own opinion is that recruits in any great numbers cannot be expected for the degree of licensed attendants, and this opinion is based upon the experience had in the State Hospitals in Massachusetts. In 1916, the nursing care for the insane in the State Hospitals in Massachusetts was standardized. This standardization arranged for a definite preliminary educational requirement of one year in high school and a three years' course for the training school for nurses. It was expected that this would reduce the number taking the training course for nurses and to supplement for this reduction a course for trained attendants was also introduced. Our expectations as to the reduction of numbers were realized and in some instances the reductions were considerable. While the standardization was successful from the standpoint of the training school for nurses, outside the question of numbers, the training course for attendants was not the success we had hoped. Not only were young women not eager to take the attendant course but in some cases had to be urged to take it. The word trained attendant appeared to be objectionable and, as some have expressed to me privately, they saw no reason why, if they were doing a part of the nurses' work, they should not be called nurses. What evidence has been presented to indicate, outside of a few isolated instances, that young or adult women desire to take a course for trained attendants and to be known as licensed attendants?

Thirdly, is it possible that we can so easily change the connotation of the term nurse? Taking care of the sick, whether by one specially trained and registered or not, is undoubtedly looked upon by people in all walks of life as nursing and I am convinced that no act of the legislature or any other thing will change the people's ideas as to how this work should be termed and classified. In a word, is not the work that is supposed to be done by these licensed attendants a very important part of nursing work and why, therefore, should it not be carried on by nurses? In the medical profession, the general practitioner in many instances is not looked upon as a scientific man and as a rule is certainly not doing specialized work, yet his work is not regarded as unimportant and he is still known as doctor. I have been told that a meeting of any nursing association in which reference is not made to Sarah Gamp and her style of nursing is rare, but would not this innovation push Sarah Gamp's work into such a state of oblivion that her name would not even be remembered within a decade or so?

In finally determining the course to pursue to solve this problem I believe the one factor for guiding us should be Service. This matter is of such a nature and is of such importance that a consideration of it should not be confined to the nursing profession only. Successful medical progress can only be attained when accompanied by adequate nursing progress and so it is rightfully as important a matter to the physician as it is to the nurse. The community, which will either suffer or be aided by the determination of this question, should also be interested and where possible consulted. I believe that the solution to be arrived at must be primarily based on the premise that caring for the sick in any capacity is nursing and that the introduction of a new name will not only be illogical, but, through its results detrimental.

In place of resorting to the licensed attendant as a means for meeting this condition there has been suggested a plan that would establish a graded system of nurses. Briefly, this would arrange for at least two and possibly three grades of nurses. If we should accept the plan of the three graded system, the highest grade, termed whatever it may, would be attained by those who have had at least a high school education or possibly one or two years in college as a preliminary requirement and who would be graduates of hospitals of high rank, giving them at least a three or four year course of training. From this grade could be obtained the scientific, the specialized nurse, and the superintendents of nurses for training schools of all ranks. The second grade would comprise that group of nurses who have been graduated from a grammar school, or better have had one year in high school, as a preliminary educational requirement, and whose hospital training would be at least two years and possibly more. This grade of nurse would be the one that would be called upon particularly to do the usual nursing in the community in private families and in general to do the work that has been done by the trained nurse up to within a few years. The third grade would simply be the practical nurse with at least one year's hospital training and whose work would lie along the lines of the present untrained household nurse of the community.

The alternative plan for this, namely to have nurses divided into two grades, could be briefly stated as follows: the first grade to consist of those who have taken at least a three or more years course in a hospital of recognized standing, and whose preliminary requirements should be a high school course or college work, and in general correspond to the requirements and training as set forth in the highest grade of the first suggested plan. The second grade would consist of those who will have had at least a grammar school education and at least 18 months or more of good hospital training. The latter plan to considerable degree corresponds to one that was proposed by the Legislative Reference Bureau in the State of Illinois and introduced as a bill. The bill, briefly, provided for two groups of nurses, one with a minimum of 27 months' training and certain preliminary requirements, to be known as registered nurse, and the other with 18 months training and less preliminary requirements to be known as registered junior nurse. The courses could be so arranged that the applicant for the course of registered junior nurse could in time, provided she met the requirements, pass on to the higher grade. Surely there would be more applications for the course of registered junior nurse than there would be for the course for licensed attendant, and the superior training of one year and a half or two years would be of some actual value to the hospital and to the community.

As I see it, the reasons against a solution of this problem by the introduction of the licensed attendant to the nursing corps, can be summarized as follows:

1. The number of nurses will relatively be greatly reduced in the hospitals and in the community on account of the extra demand, and actually reduced on account of the raising of the standards and requirements.

2. To meet this condition a large part of what is now considered nursing work will have to be done by attendants.

3. The suggested course for attendants and requirements are not sufficiently high to fit them for this work.

4. The improbability of being able to induce young women, in sufficient numbers to take the trained attendants' course.

5. The use of a new term that will not be appreciated by the worker or accepted by the public.

My reasons in favor of a graded system consisting either of two or three grades may also be summarized as follows:

1. It will provide for the highly trained nurse and will arrange for the raising of the requirements and standards.

2. It will arrange for the accomplishment of the usual hospital and community nursing by nurses who will have had suitable and sufficient training.

3. It will act as a stimulus or inducement for young women without the highest preliminary requirements to enter the nursing field, and so provide us with the number required.

4. It will arrange for promotion from one grade to another.

5. It will dispense with the necessity of using an illogical and unappreciated term.

In addition to what I believe to be the correct method as to the nurse or the attendant side of this question, there is another very important consideration connected with the nursing problem. Public schools for some years have included in their curricula preliminary work looking toward the pupils' entering various vocations and professions, but I am told that it is at least not a uniform practice for either grammar or high schools to give courses which may either stimulate the interest of the pupil to take up a nursing course or to provide any special work of a preliminary character. As it is such a vital matter for the individual and the community I believe that those of us who truly understand the question should bring it to the attention of the school authorities so that not only would suitable courses be given in the secondary and high schools but the importance and necessity of it could be so presented to the pupil that she would feel that to become a nurse is as much an act of patriotism as it is for a boy to become a soldier. It should no longer be considered as a profession that might meet the individual's likes and inclinations but should be looked upon as a matter of defense and national duty.

Just as it is important for the wise and intelligent citizen to become acquainted with and watch the changes, the theories, and the programs in the political, economic and social spheres so this matter is important to all and especially to the members of the nursing and medical professions. Keeping in mind the general welfare of the nation, recognizing our duties as members of allied professions, and realizing the vital importance of this whole question as it affects the individual, the community and the nation, I believe that a solution of this problem should not be attempted on a basis of expediency or the seeking for higher educational standards alone, but should be solved on a basis of service to and general welfare of the nation.

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# CONDITIONS IN PALESTINE DURING THE WAR AND MEDICAL RELIEF AMONG THE CIVIL POPULATION AND THE REFUGEES.[*]

By Izak Alcazár, M.D., Boston.

It was not long after the war broke out that the medical profession as a whole was awakened to its sense of responsibility in the struggle for world freedom. The work of the American Red Cross in Palestine made a very strong appeal to me, but owing to illness I was prevented from joining the organization.

After the lapse of several months, I had the opportunity of affiliating myself with the British Expeditionary Forces in Palestine. My chief aim was to bring relief to the civil population, irrespective of race or creed.

On arrival in the Holy Land, we found the need of physicians was most urgent. At the outbreak of the war the doctors who had been subjects of the Allies were either expelled from the country or taken prisoners. Those who had been subjects of the Central Powers joined their respective armies, thus leaving the population of Palestine without any medical aid whatsoever. The quack doctor then flourished to his great advantage but to the detriment of the health of the inhabitants. The ophthalmic condition was deplorable. There was only one ophthalmologist in Jerusalem in charge of the eye hospital.

In order to appreciate the need of the medical work which it was my privilege to do in Palestine, it will be necessary to give a brief description of the conditions which prevailed there at the time and shortly subsequent to the outbreak of the war.

The first knowledge that burst upon the Palestinians that Turkey had cast her lot with Germany was made known to them by native musicians going through the streets of towns and villages sounding a drum to the tune of a funeral march. Many of the inhabitants looked out of the windows, and others congregated in the streets to enquire as to the purport of this sudden dirge. Thousands and hundreds upon thousands soon found out that it was the call to an untimely end. It was indeed the angel of death calling hosts of men, women, and children to misery, disease, starvation and death.

## JEMAL PASHA.

There was a Turkish military authority in Palestine who resembled a devil in human form. His name was Jemal Pasha. He was the author of many ferocious orders, such as public floggings, expulsions and hangings. He had a special hatred for Jews and Americans. Daily there would be posted lists of such persons who were to be deported to Damascus, Beyrut, Constantinople or to some remote place. Of course the Government did not provide them with the means of transportation or with provisions. One young woman, an American citizen, who was ill with fever, begged permission to remain behind until the fever should subside, but her request was denied, and she was carried away in a litter. A certain young man, also an American citizen, the director of an important concern in Jerusalem, was seized in his place of concealment, put in irons, and sent to Damascus. He has not been heard from since. The United States refrained from declaring war against Turkey in order that the lives of American subjects in Turkey might not be endangered. Here is the proof that Turkey did not respect Americans within her borders.

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[*] On the 25th of May, Dr. Alcazár sailed for Palestine the second time to open an eye, ear, nose, and throat hospital for the needs of the civil population. The plan is to establish the hospital in Haifa and hold clinics in the surrounding villages, one in Nazareth and one in Acca. The chief feature of the work will be to educate the natives as to the contagious nature of trachoma and in prophylactics.—*Editor*.

In my travels through Palestine I have seen places where these distressed refugees spent weeks, months, and even from three to four years. Many of them no sooner settled themselves in their improvised miserable mud huts than they were ordered to move on to another place. Is it to be wondered that the pestilence of typhus, cholera, malaria, and starvation swept away thousands like the plagues of Egypt? Fifty per cent. more people died of disease than from actual warfare. Women and girls were subjected to the grossest insults by the military forces. I have been told by many refugees that the Germans were more barbarous in that respect than the Turks or the Austrians. The virtue of a girlhood was a common price to pay in order not to be accused falsely of being a spy, or to save a brother, a father, a husband, or a sweetheart from the service of the Army. I have learned from reliable sources that during the war few girls could pride themselves of a God-given virtue.

As I passed through the streets of towns and villages from which the inhabitants had been forcibly expelled, I saw on every side houses with closed doors, and windows fastened. One remembered that here and there such a family had lived and that active life had once flourished within its walls. The houses and schools surrounded with gardens, where hundreds of children had played, were now as silent as the tomb. The plague and pestilence had swept away all signs of human life and left complete desolation in their trail.

In some places where there was not time enough to expel the entire population, great misery ensued when epidemics broke out. The Turk always managed to carry away all hospital and medical supplies, hence there was not the means of combating any of the diseases that smote the populace. The mortality increased so rapidly in such forsaken and devastated villages that the dead lay on the ground unburied for days. The hyenas and the jackals would come down from the hills at night and feed upon the carcasses. What an agony must those inhabitants have experienced, knowing that their government had betrayed them and that they had been left helpless to starve and die!

## THE ESTABLISHMENT OF THE FIRST EYE, EAR, NOSE AND THROAT HOSPITAL IN PALESTINE.

It has been necessary to give the above description of the conditions in Palestine following the outbreak of the war to the conquest of Jerusalem in order to set forth the urgent need of medical aid to its suffering inhabitants.

I will not attempt to narrate the splendid work of the various departments of the Medical Unit to Palestine, but will confine myself to a brief outline of the work of the eye, ear, nose and throat department, of which I was in charge.

The first six months of my service were in Jaffa. My clinic and hospital consisted of six rooms and a kitchen. My consultation room served both for clinic and operative work, as it was impossible to spare a room exclusively for that purpose. For three weeks I did not dare to operate for fear of infection; but as the urgent cases continually increased the only alternative was to clean the clinic-room the best possible and operate after clinic hours. Two kitchen tables covered with a marble slab formed the operating table. Had my colleagues in the United States seen the flies and the sand in this improvised operating room they would have condemned it severely. Through this room passed about two hundred and fifty patients daily, in all grades of filth. Some of the Bedouins were so dirty that the stench which emanated from their bodies was stifling. Many of the refugees were not any better off. Through the generosity of a friend in the United States I was enabled to furnish free baths, soap and towels to such patients; otherwise it would have been impossible to tolerate their presence. In addition to their filth, the lice and fleas were another source of menace to myself and to the nurses. We were obliged to wears caps and gowns in order to protect ourselves.

It would seem a vain boast, but nevertheless

A Bedouin Woman.

it was a fact, that despite the uncleanly condition of the patients there was not a single infection during five months of operative work in Jaffa hospital.

### CLASSES OF PATIENTS.

The classes of patients consisted of Jews, Christians and Mohammedans. The Moslems are by far the most needy, especially the peasants and the Bedouins. The latter class lives far away from the cities and neglects itself more, and consequently it is of greater menace to infection, and a potent agent in spreading the disease of trachoma. They suffer more from defective vision and blindness than those who live in the cities. The peasants are the next sufferers in point of severity. They come to the cities only after their condition is severe and alarming. Seventy per cent. of the Arabs present a trachomatous condition requiring some operation for relief; many are already beyond recovery.

### METHODS OF TREATMENT.

My knowledge of Spanish, French, Italian, and especially Arabic, has been of the greatest assistance in my work. This medium of common understanding made it more possible for me to aid the patients and combat the disease. Patients came from all over Palestine. The first day there were thirty-five. At the end of one month it was necessary to limit the number to two hundred and fifty a day. It was a physical impossibility to see more. They would begin lining up at six in the morning. We were compelled to employ a gateman and two policemen to keep order among the patients.

The new cases were first examined, and then if there was any time left before noonday, the severe old cases received attention. But once a week all the old cases were reëxamined.

The clinic and the hospital were conducted according to the same methods as the Massachusetts Charitable Eye and Ear Infirmary of Boston, where I received my training for three years as resident surgeon. It was only by the hearty coöperation of a large force of trained nurses and orderlies that I was enabled to handle such a large clinic. The patient was brought before me with his history card. The secretary at my left wrote the diagnosis, and the treatment to be followed in the clinic and at home. An assistant druggist gave the patients medicines for home use, and then they were escorted to the next room where a trained nurse and her associates supplied the medicaments to the eyes or ears, and gave them instructions as to how to treat themselves at home. The severe cases were seen every day; others came to the clinic two or three times a week.

Heretofore physicians in Palestine were accustomed to treat their patients in the clinic only. The results of the new system which I introduced into the combined clinic and home treatment were greatly appreciated by the patients, especially by those who came from a distance of two or three hours on foot, as well as by the business men, and above all by the mothers who left their children at home.

With some patients it was found necessary to compel them to pay us daily visits, because they would not treat themselves at home, either on account of ignorance or sheer laziness. It was a great pleasure to find that the Arab population was more faithful in following the instructions given for home treatment than were any of the other classes of patients who possessed a higher degree of intelligence than the Bedouins.

The afternoons were set aside for operations. Upon some days they numbered as many as ten, but later in my service I was obliged to limit them to five, as I was then getting on the verge of a nervous breakdown.

It seemed to me that during the first month of my service I was as busy as I would wish to be, but soon I realized that it was but the beginning of the hard work which lay ahead of me with the return of the refugees from the towns and villages that were liberated in the final blow in Palestine. It may not be amiss to narrate now the story of this remarkable and historic drive.

*(To be continued.)*

## Book Reviews.

*The Johns Hopkins Hospital Reports,* Volume XIX, Fasciculus 111. Baltimore: The Johns Hopkins Press. 1920.

A recent issue of *The Johns Hopkins Hospital Reports,* Volume XIX, Fasciculus 111, contains an important report of a study of arterio-venous fistula by Dr. Curie L. Callander. The author has discussed the history of arterio-venous aneurysm, its classification, etiology, pathology and pathological physiology, symptomatology, and its diagnosis and prognosis. The article contains consideration of non-operative methods of treatment by the injection of coagulating fluid, galvano-puncture, medicinal treatment, and indirect and direct compression, and of operative methods of treatment including the Hunterian ligation, Anel's ligation, double arterial ligation, quadruple ligation, incision of sac, and extirpation. The conserving operations which maintain the continuity of the vascular paths,—ligation of the communication, lateral suture, and end-to-end suture,—are described, and the Korotkow blood-pressure test for determining the efficiency of the collateral circulation is explained. Brief mention is made of the work of Amussat, Franck, Vignolo, Jaboulay, Carrel, and Reid in the field of experimental arterio-venous aneurysm. A detailed statistical table of four hundred and forty-seven analyzed cases is included in the report.

*Lectures on Surgery to Nurses.* By ALAN H. TODD, B.Sc., M.S. Lond., F.R.C.S., Eng. London: Edward Arnold. 1920.

This volume, "Lectures on Surgery to Nurses," by Dr. Todd, is made up of a course of lectures given by him during recent years to the probationers at Guy's Hospital. It is not the manual of surgical nursing, but rather an attempt to present simply and clearly those fundamental truths of pathology and surgery which are necessary if the nurse is to work with the greatest efficiency. Believing that the first essential in intelligent coöperation is an understanding of what is being done by the surgeon, the author has endeavored to explain the vital principles of surgery, confining himself, however, to matters of practical interest and applicability. The lectures include addresses on Inflammation, Ulceration and Gangrene, Inflammation of Bone, Fractures and Dislocations, Diseases of the Joint and Spine, Haemorrhage, Shock and Collapse; Injuries and Diseases of the Head, Brain and Spinal Cord; Tumors, Herniae, Acute Abdominal Conditions, Chronic Diseases of the Alimentary Tract—of the Glands—and of the Breast, Diseases of the Respiratory System, and Diseases of the Urinary Tract. The text is illustrated by a number of excellent plates. Study of these lectures will enable the nurse to undertake her professional duties with enlightened interest and increased efficiency.

*Plymouth and the Pilgrims.* By ARTHUR LORD. Boston: Houghton Mifflin Company. 1920.

"Plymouth and the Pilgrims," by Arthur Lord, is one of the most readable contributions to our literature relating to the Pilgrims, to be published this year. Its three section headings: Plymouth before the Pilgrims; The Pilgrims before Plymouth; and Plymouth and the Pilgrims, indicate very clearly the scope of the book. The fact that it was selected this year for the Colver Lectures in Brown University is significant of the excellence of the work.

Mr. Lord refrains from personal mention of many of the individual Pilgrims, but, in one of the exceptions made, pays high tribute to Samuel Fuller, who was the Pilgrims' doctor from 1620 to his death in 1633, and the only physician of whom we have record in New England during that time.

The book is a concise statement of historic facts, many of which are little known, woven together into a delightfully interesting narrative. It should be warmly received by everyone interested in our early history.

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## THE HARRISON LAW FROM THE ETHICAL POINT OF VIEW.

A question which seems to require much more careful consideration than is usually bestowed upon it is the influence of the Harrison law upon medical ethics, or to speak more specifically, on the physician's attitude towards his patient, quite apart from the nature of his malady. If it be true that much sickness is the patient's own fault, the result of errors or vices which he might avoid, it certainly seems true that the physician has nothing whatever to do with the morals of a case. Ethically the physician is as much bound to employ his whole skill and knowledge in treating a man whom he knows to be in the wrong, as he is in treating the most worthy of his patients. To the honor of the profession, there is no doubt that he pursues his duty, although his personal feelings may be both outraged and disgusted. Unfortunately, circumstances may be too strong for him; and in the case, for example, of drug maniacs the almost superstitious horror of the public at the spectacle of narcotism has exercised a subtle influence on the physician's ethical feeling; he has become, as it were, denatured by a process akin to that which can turn the most wholesome substance, like a really philosophic mind, from its original purpose.

The essence of the change is the law itself. It is often forgotten that the law is designed primarily to raise revenue; it is also intended to prevent drug users from getting large quantities of their favorite drug, but it throws difficulties in the way of those who would restrain such people from their habits. In many of these cases the patients are men who have acquired the habit of taking bromides sulphonal, acetanilid, and caffeine, which can be obtained without a physician's prescription. Experience shows how very uncertain the effects of these drugs may be in different persons, and therefore how dangerous it is that any person who has acquired the habit of abnormal drug taking, should be free to walk into a chemist's shop and procure and administer to himself a drug for which he has a morbid craving, and whose effects he cannot estimate from his previous experience; even if he has the self-restraint which is probably lacking.

Caffeine is sold in ever-increasing quantities, and furnishes a problem of the highest interest. It is not on the list of forbidden drugs, and yet the curious fact has been established that the public has been told a great deal about its harmful effects. That it is the cause of nervous breakdowns and leads to the taking of drugs commonly known as "dope" cannot be doubted. During the war it was carefully studied from this point of view in Germany. It appears that this drug, like all those in the chemical group in which it belongs, contains an hypnotic and also a toxic element, the effects of which are observed on the next day. Its similarity to the action of morphine may be seen from researches on that drug, summarized in a recent issue of the *Journal of the American Medical Association*: "in small doses the hypnotic element largely predominates. After large doses the toxic element begins to appear and gradually to equal and exceed the hypnotic." The difference, however, is significant, since, in the case of caffeine, these effects are delayed until the "day after."

It is worth while to note than caffeine and the bromides are combined in preparations which, among other things, make the patient "comfortable." Here an ethical question arises which, in the case of morphine, has been decided by the law and by much, though not all, medical opinion. Should a dose of morphine be administered to a patient or person to make him "comfortable"? The Supreme Court has ruled in the negative. Whether the last has been heard of this decision or not, the wider questions it opens up are very serious. In the increasing worries and anxieties of modern life, nervous complaints and nervous breakdowns are constantly betraying more people into recourse to drugs for producing sleep. It is easy to become a victim of this seductive class of drugs; and it ought to be extremely difficult for anyone to prescribe and procure them for himself without medical advice. But, from the ethical point of view, protection and help are due not only to the patient or person, but also to the families of those who are unfortunate enough to have any of their members among drug victims. They are a cause of excessive anxiety and distress to those who have the care of them.

Should such persons be made "comfortable" by an injection of morphine? The law says, "No"; in an emergency it is likely that physicians would ethically say, "Yes." For whether caffeine, or morphine, or any other of the numerous drugs on the market, be the cause, drug takers in these circumstances would probably require an opiate. Under conditions created by the law it is most difficult to decide. It need hardly be said that, before the Supreme Court's decision, most physicians would probably see nothing wrong in an injection of morphine, although medical practice has always been on the belief that the use of the drug is not only unnecessary, but harmful. Certainly the decision complicates not only practice, but life, very much, since for most drug cases, the choice of a suitable treatment from which all drugs are excluded is still more complicated. In the case of the morphinomaniac the exclusion of the drug is sufficiently dangerous to make it necessary to continue its use, at least for a while, but legally and ethically this has become so difficult that much suffering, and still more illicit traffic have been the results.

The immediately practical suggestion due to this situation is for the establishment of certain institutions purely for the purpose of treating drug habits, and that when the patient consults the physician the first step taken as a matter of course should be a complete diagnosis. This is merely common-sense, and may at first sight seem too obvious. But errors in diagnosis are unfortunately very common. One of the worst results of the law, as anyone must observe who studies these cases in their moral and psychic aspects, is the tendency to narrow the inquiry to comparatively few drugs, and to regard these as the sole causes of the drug habit. It would be interesting to discover if more mischief is done by illicit drugs than by those which are more generally consumed, because they can be procured without medical advice. It would seem that if the majority of people ever attain to a simple, and from the medical point of view, a more rational way of living, it will be due to the pioneer work of doctors and legislators who see the mistakes made in this groping in the dark for a drugless ideal, which leaves the illicit trafficker free to fill his pockets, while tying the hands of the ethical physician.

Paul Bartholow, M.D.

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## MEDICAL NOTES.

Honor to Dr. Bernard L. Wyatt.—In recognition of his services in organizing the French campaign against tuberculosis, Dr. Bernard L. Wyatt, of the Rockefeller Institute, has been made a knight of the Legion of Honor of the French Republic.

Central Committee of the American Red Cross.—Of the six government members of the central committee of the Red Cross recently appointed by President Wilson, three are physicians: Dr. Livingston Farrand, chairman; Major-General Ireland, surgeon general U.S.A.; Rear Admiral Stitt, surgeon general, U.S.N.

Vivisection in California.—The bill prohibiting vivisection and also anti-vaccination measures were defeated in the recent referendum in California.

New York Post-Graduate Medical School and Hospital.—Announcement has been made of the following changes in the pathological chemistry staff of the New York Post-Graduate Medical School and Hospital: George Eric Simpson, Ph.D., has resigned as instructor, to become assistant professor of biochemistry at McGill University. James J. Short, M.D., has resigned as instructor, to complete his interneship in the hospital. To fill this latter position, Hilda M. Croll, A.M., formerly associate professor of physiological chemistry at the Women's Medical College of Pennsylvania, has been made associate. Cameron V. Bailey, M.D., has been appointed assistant professor, to devote his time largely to respiratory and metabolic work.

Election of Dr. Rudolph Matas.—Dr. Rudolph Matas, New Orleans, was elected vice-president of the American Medical Association at a recent session of the board of trustees. Dr. Matas will succeed Dr. Isadore Dyer.

University of Colorado.—An appropriation of seven hundred thousand dollars has been made by the General Education Board of the Rockefeller Foundation to the University of Colorado for the construction of a medical school and hospital.

Award of Distinguished Service Medal.—The Navy distinguished service medal has been awarded to Dr. William C. Braisted, surgeon-general, U. S. Navy, for meritorious service during the war.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending January 1, 1921, the number of deaths reported was 229, against 253 last year, with a rate of 15.95 against 16.32 last year. There were 39 deaths under one year of age against 39 last year.

The number of cases of principal reportable diseases were: Diphtheria, 70; whooping cough, 25; scarlet fever, 42; measles, 41; tuberculosis, 30.

Included in the above were the following cases of non-residents: Diphtheria, 7; whooping cough, 1; scarlet fever, 5; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 5; whooping cough, 1; scarlet fever, 4; measles, 2; tuberculosis, 12.

Included in the above were the following cases of non-residents: Scarlet fever, 1; tuberculosis, 2.

Mortality Rate of Boston.—It has been estimated from figures issued by the Health Department that the death rate in Boston will be lower than for the preceding year. During the past eleven months, there have been 10,619 deaths in the city, and it is expected that the number of deaths in December will not exceed one thousand. If this estimated figure proves to be correct, there will have been almost six hundred less deaths during the year than in 1918, when deaths caused by influenza made an unusually high mortality rate.

Baby Hygiene Association.—In order to direct more attention to problems of correct posture among the children under its care, the Baby Hygiene Association of Boston has recently arranged for coöperation with the Boston School of Physical Education. Classes are held each week at the Baby Hygiene stations, and children who show signs of postural defects are given individual and group exercises which tend to prevent stooped shoulders, narrow chests, crooked backs, and flat feet. By means of careful physical examinations, slight defects are noted by the association and corrected before they become serious enough to require hospital care and treatment. Home instruction is given by the nurses and dietitians in order to interest the mothers.

Since its organization eleven years ago, the enrollment of babies by the association has increased from a few babies to nearly nine thousand, and the annual infant mortality rate has dropped to 96.6. The association now has thirty-eight nurses and dietitians who visit the homes of all babies reported to them, to teach the value of clean clothing, fresh air, proper food, and sanitation. Conferences are held at least once a week in each of the twenty-two Baby Hygiene stations. The babies are weighted and their gain or loss recorded. Approximately eight thousand mothers visit the stations. There are still many mothers and babies who are not being reached by the association. Not more than eight thousand babies can be cared for by the association each week with its present equipment. There are at least six localities in the city which need branch stations, which can not be opened unless the funds of the association can be increased.

### NEW ENGLAND NOTES.

Dissolution of the Italian War Relief Fund.—The Italian War Relief Fund of America, which has had its headquarters in Boston, has been dissolved. The Committee has expressed its appreciation of the generosity of its contributors, and rendered the following account of its activities:

"The Fund was started in 1915, shortly after the entrance of Italy into the war, for the purpose of aiding the families of Italian Reservists called to the colors. Presently, however, it enlarged its scope, and devoted itself also to sending across the water surgical dressings, woolen goods, food and money for the relief of the wounded, of the refugees from invaded provinces, of widows and orphans. Means were obtained by direct appeal and by lectures, concerts, exhibitions, sales and garden parties. In all, the committee shipped 1300 cases of woolen goods and collected in money $332,536.27. The workshop where dressings and clothes were prepared was for years a place of intense activity. Donors may be assured that their gifts have gone unimpaired to the alleviation of the keenest suffering; their contributions have been received by the Italians with touching appreciation, and have been potent in maintaining friendship between two nations.

"Aid has been widely distributed in Italy, for purposes too varied for brief enumeration. Among them may be mentioned the care and rehabilitation of blinded and mutilated soldiers; relief of the families of soldiers and sailors; the housing, nourishment and instruction of war orphans; assistance to officers' widows; the care of sickly children; the purchase of cattle for farmers in the devastated regions; the Italian Red Cross. Individual cases of distress in great numbers have been discovered and dealt with. Three of the largest single items are appropriations, in round numbers, of $53,000 for refugees; of $40,000 for the equipment of a part of the hospital at Porta Furba for tubercular returned prisoners; of $18,000 for construction in the evacuated Provinces. The rate of exchange has increased manifold the efficacy of each dollar.

"In addition to its own collections, above stated, the central committee has, by the organization of branches in various parts of the country, from Maine to California, stimulated the contribution of large donations of goods and money.

"Confident that the charity of sympathizers will not cease with the dissolution of the Fund, the Committee takes pleasure in announcing that gifts may be sent henceforth, either to Pasquale Galassi, 382 Boylston street, Boston, or directly to Comm. H. Nelson Gay, Palazzo Orsini, Rome."

French Orphanage Fund.—The New England branch of the French Orphanage Fund has acknowledged contributions to the total amount of $625,376.09.

Campaign for Hospital in Portsmouth, N. H.—On December 1, the citizens of Portsmouth, N. H., and a number of surrounding towns will begin a campaign to raise by popular subscriptions a fund with which to provide a modern general hospital with adequate equipment. Three hundred thousand dollars will be spent in rebuilding one part of the present hospital, in remodeling the remainder of the structure, and in erecting a large addition. One hundred thousand dollars has been pledged by one of the citizens of Portsmouth, and a fifty thousand bequest for a modern surgical department will be made available through the raising of one hundred and fifty thousand dollars. The new hospital is urgently needed, for, with a bed capacity of thirty-two, the present hospital has been obliged to maintain a daily average of thirty-nine beds by converting the reception room into a small ward and at times by placing patients at the ends of corridors. The new institution will have a bed capacity of seventy-five, and in times of epidemics and other emergencies, it can accommodate more than one hundred without serious overcrowding.

"Friends of Poland" Fund.—Contributions to the "Friends of Poland" fund have reached a total amount of $148,976.17.

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## RECENT DEATHS.

Dr. Walter Sydney Johnson of Los Angeles, Calif., a Fellow of the Massachusetts Medical Society, died in that city September 17, 1920, aged 49. He was a graduate of Harvard Medical School in 1898, and had been Professor of Obstetrics in the College of Physicians and Surgeons, Los Angeles, for eight years.

Dr. Samuel Thomas Davis, a Fellow of the Massachusetts Medical Society, died at his home at Vineyard Haven, April 18, 1919, aged 63 years. He was a graduate of the Bellevue Hospital Medical College in 1878, and joined the Massachusetts Medical Society from Orleans in 1880.

Dr. James Henry Grant, a Fellow of the Massachusetts Medical Society, died at his home in Lynn, December 28, 1920, aged 70 years. Dr. Grant was born in Ireland. He was a graduate of the Bellevue Hospital Medical College in 1883 and had been a member of the state society since 1895. He was a member also of the Lynn Medical Fraternity. Dr. Grant assisted in the founding of the Union Hospital and the establishment of the Nurses' Home; he was superintendent of the Union Hospital for 12 years. His widow, two sisters and three brothers survive him.

Dr. Howard Edwin Settle, aged 29, died Dec. 20, 1920, at the Parker Hill Hospital, from appendicitis. Dr. Settle was a member of the Massachusetts Medical Society and a Fellow of the American Medical Association.

Dr. Willis P. Craig died at Walpole, N. H., on Dec. 28, 1920. Dr. Craig served throughout the war as a member of the Medical Corps stationed at Camp Dix, New Jersey. He is survived by his widow and two children.

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## Original Articles.

### THE CLINICAL RECOGNITION OF THE VARIOUS TYPES OF PAROXYSMAL RAPID HEART ACTION.

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Paroxysmal rapid heart action includes those conditions in which the heart suddenly takes on a new rhythm, beating rapidly and regularly or sometimes irregularly. The beginning and ending of such attacks almost always occurs instantaneously, that is, in one or a few heart cycles the rhythm changes. Such attacks vary in duration from several seconds to several weeks. The proper diagnosis of these conditions is best made if they are observed during the attacks although frequently one has to depend entirely on the history because of the transient nature of the upsets and the impossibility of catching the patient while the abnormal rhythm is present. It therefore becomes extremely important to question the patient concerning the nature of the attacks. They may complain of periods of palpitation, of "fluttering of the heart," of "pounding or thumping of the heart," that the heart "runs away," or "the heart beats very fast," and so forth. If the story is that the heart gradually accelerated from the normal rate to the rapid rate, it is quite certain that the condition is not a true paroxysmal tachycardia; the same is true if the heart gradually quieted down. People frequently have periods of palpitation or vigorous heart action from conscious or unconscious emotions through the extra cardiac nervous mechanism wherein the heart rate gradually accelerates. Here the rhythm is normal but rapid, and it should be called normal tachycardia and be distinguished from the paroxysmal types.

It is the purpose of this paper to discuss how normal tachycardia can be distinguished from the paroxysmal rapid heart action and to differentiate the various types of the latter where that is possible, with such simple means as we all have at the bedside, and to touch upon the indications for the proper treatment of the various paroxysms.

Paroxysms of tachycardia may have their origin in three different parts of the heart, that is, in the auricles, in the ventricles and in the junctional tissue between the two (auriculoventricular node). The latter is so extremely rare and impossible to be recognized without special graphic means that it will not be considered in this discussion. Paroxysms arising in the auricles are subdivided into three types, *paroxysmal auricular tachycardia* (the most common condition met clinically), *paroxysmal flutter*, and *paroxysmal fibrillation*. It is important to try to distinguish one type from the other for their behavior is different and frequently the exact diagnosis can be made at the bedside without any elaborate aid. Fortunately most paroxysms end without producing any permanent damage to the patient, but occasionally it may be a question of life and death or a matter of the loss of a limb and then the recognition of the exact condition and the institution of the proper treatment becomes urgent.

Let us assume that we have a patient whose heart is beating rapidly and regularly at the rate of 170. It is first necessary to know whether it is a normal or an abnormal tachycardia. The history of the onset of the attack or similar previous attacks as mentioned above is important. The condition may be a normal acceleration due to some infection, or nervous influence or hyperthyroidism. One should count the apex rate carefully for 60 seconds, and repeat this in five or ten minutes. The counts will either be exactly the same or not vary more than two beats if we are dealing with an abnormal tachycardia. It must be emphasized that in counting there need be no greater error than two beats; one, as the second hand of the watch crosses the starting point and the other, at the last second of the minute. If the two counts taken as above differ by three or five or more beats, it is not apt to be an abnormal tachycardia. This very simple procedure has been of great help in diagnosis. It is surprising how constant is the rate of a regular abnormal tachycardia from minute to minute, sometimes even from day to day, and from one attack to another over the course of many months. If the condition of the patient permits it, one can try to influence the heart rate by changing from a reclining to an upright position or having the patient hold a deep inspiration. None of these procedures will alter the minute count more than a few beats if it is an abnormal regular tachycardia, and will change it more markedly if it is a normal acceleration.

By the above means one decides whether the heart mechanism is normal or abnormal. If the rhythm is regular and rapid, and it appears to be abnormal, the condition may be paroxysmal auricular tachycardia or paroxysmal auricular flutter. (Ventricular tachycardia will be considered below). In auricular flutter the auricular rate will be twice the rate one counts at the apex; that is, if the apex count is 170, the auricles may be contracting at a rate of 170, in which case it is auricular tachycardia; or they may be contracting at twice the rate, or 340, in which case it is auricular flutter. In fact there is practically always some degree of block associated with auricular flutter although the ventricular rate may not be regular. However, when cases of flutter are first seen, especially if they are of the paroxysmal type, they are very apt to have a 2 : 1 block. This results in a perfectly regular and rapid apex rate. It is generally possible to distinguish the regular rate of flutter from that of tachycardia. Although both remain perfectly fixed with change in position of the patient from a recumbent to an upright position, and the count will continue constant from minute to minute, vagal stimulation affects the two conditions quite differently. In the case of auricular tachycardia, pressure on the vagus nerve* or ocular pressure will have no influence at all or it will end the attack completely. There is practically never any slowing of the rate unless the attack ends. Very rarely the rapid rate is resumed after several seconds and leaves one in doubt whether the attack was stopped at all, or whether there was only a temporary slowing. There is sufficient graphic proof that the latter occurs with such rarity that it can be ignored in ordinary work. On the other hand, it is generally possible to slow temporarily the ventricular rate in cases of flutter by vagal pressure, but there is no known instance of ever ending an attack by this procedure. During the vagal stimulation if one auscults simultaneously one hears the ventricular rate become slow, or at any rate the rapid rhythm is disturbed or may become irregular. One may therefore conclude that if the attack is completely arrested it is one of paroxysmal auricular tachycardia and if it is temporarily disturbed it is auricular flutter; but if it is not influenced at all, as may happen in either condition, one is still in doubt.

A further simple test is of great help in distinguishing these conditions, and that is the actual rate of the heart. If the apex is counted at any regular rate from 185 to 205, the condition cannot be auricular flutter but must be one of tachycardia, for if it were flutter, the auricles would have to be beating at twice that rate, or 370 to 410. This is a much more rapid auricular rate than one finds in flutter, the general lower and upper limits of which are 250 and 350. (I have observed one case of flutter with an auricular rate as low as 208 and another as high as 358). Given a case with a regular apex rate of 190, therefore, it can be no other condition than paroxysmal tachycardia.

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* Pressure is applied over the left or right carotid artery rather vigorously against the cervical vertebrae, entirely obliterating the flow of blood through the corresponding carotid artery and is generally maintained for 5 to 10 seconds.

Finally it is necessary to recognize the attacks of paroxysmal auricular fibrillation. This condition is much more common than has been generally believed. Auricular fibrillation should no longer be called "perpetual arrhythmia," for in recent years the transient form has been observed under numerous varied circumstances; during acute infections like pneumonia and rheumatic fever, during digitalis therapy, in cases of hyperthyroidism, during convalescence from a surgical operation, in chronic cardiac patients especially in those who eventually develop the permanent form of the arrhythmia, and even in otherwise healthy people. The diagnosis is made in the same way as the permanent type of the arrhythmia. The rate is apt to be moderately rapid, about 160, and grossly irregular. At times the beats may come in such rapid sequence that they may appear to be regular; however, on more prolonged examination irregularities will appear. There will be a pulse deficit, that is, a lower radial than apex count because some of the beats will fail to reach the wrist. Too much reliance must not be put on the presence of a pulse deficit. It is thought by some to be present in no other conditions than auricular fibrillation. This is far from the truth as in all types of paroxysmal rapid heart action it may be impossible to count as many beats in the radial artery as over the precordium. In these latter conditions the pulse deficit is brought about or accentuated by the phasic variation of the strength of the pulse wave resulting from respiratory movements, and partly by an alternation of the pulse which frequently accompanies the attack. Repeated apex counts of the heart rate at short intervals during paroxysms of auricular fibrillation will show distinct differences unlike the other types of paroxysmal rapid heart action. In one case, a minute count of the apex was 163 and five minutes later it was 157. Vagal stimulation may temporarily slow the ventricular rate but will not stop an attack of paroxysmal auricular fibrillation. It may be said that in general one will not find it difficult to recognize paroxysmal auricular fibrillation using the same criteria that enable us to diagnose the permanent type of this arrhythmia.

So far we have not considered paroxysmal tachycardia of ventricular origin. This condition is very much more rare than the auricular type and cannot be recognized except by electrocardiograms. These attacks are very apt to be short, rarely lasting more than several hours, but are generally associated with serious myocardial disease. The prognosis is rather grave. In the few that I have seen the rhythm has been rapid and apparently regular, but on very careful attention either while listening to the heart beat or on measuring the heart cycles in the graphic tracings one can detect slight variations which do not exist in paroxysmal auricular tachycardia. Furthermore, there is no known instance of arresting an attack of ventricular tachycardia by vagal stimulation. These few points might lead one to suspect ventricular tachycardia at times and might enable one to rule it out at other times, but final proof of its occurrence cannot be made without graphic means.

In recapitulation, one can see that by using such simple means as an accurate count of the apex rate and the pulse rate repeated under different circumstances and observing the effect on the heart of pressure on the vagus nerve or over the eye ball, and of holding a deep inspiration, it will often be possible to determine whether a rapidly beating heart has a normally accelerated mechanism or whether it is one of the various abnormal paroxysmal conditions: furthermore, it will be possible in many cases to distinguish the various types of abnormal tachycardias (See table). It is important to try to distinguish the various forms of paroxysmal rapid heart action because the treatment will depend upon the correct diagnosis. Furthermore, occasionally it becomes extremely urgent to stop an attack if possible, particularly as happened in one of our cases while a surgical operation was being performed and as in another who lost his arm from dry gangrene during a previous attack. Vagal stimulation by direct pressure over the carotid artery or by ocular pressure will end one type of paroxysmal rapid heart action and not the others, while proper digitalis therapy will control the course of paroxysmal auricular flutter and auricular fibrillation.

In treating the various types of paroxysmal rapid heart action it must be borne in mind that many of them come and go, do no harm, disturb the patients only slightly, and keep recurring over a period of many years. This is particularly true of paroxysmal auricular tachycardia which condition frequently exists in otherwise normal people. However, at times the attack precipitates the patient into a very serious state and threatens the life of the patient. One such case developed an attack while under anesthesia and it seemed to the surgeons that she might die on the operating table. Another patient lost his left arm from dry gangrene during an attack, was aphasic for several months during a second, and had a complete hemiplegia during a third before he was observed by me. In both of these two cases vagal stimulation was successful in ending the attacks. The first one was arrested by direct pressure over the carotid artery, and the second by ocular pressure. In general it may be said that repeated attempts should be made to stop the attacks of paroxysmal auricular tachycardia by one or another of the means of vagal stimulation, that is, holding a deep inspiration, pressure over the carotid arteries or ocular pressure. In more than half of such cases I have been able to restore the normal heart rhythm. Heart drugs will prove of very little assistance in such patients. They should remain in a recumbent position during the attack unless it is very mild and does not disturb them at all.

Paroxysms of auricular flutter and auricular fibrillation are more apt to occur in people who have some disease of the heart. If the clinical condition of the patient is embarrassed by these attacks digitalis should be given, because although they may only last several hours or a few days if untreated, they are apt to recur, in which case digitalis will prepare the heart for subsequent attacks and will prevent a marked acceleration of the ventricle which would otherwise result. Furthermore, some cases will show signs of marked cardiac failure during such attacks and they are to be treated like any decompensated cardiac patient. Great improvement is to be expected, however, because digitalis has a specific action in diminishing the ventricular rate in these two forms of abnormal rhythm. The treatment of attacks of ventricular tachycardia is not so gratifying. Prolonged rest in bed is essential and digitalis in moderate doses over a long time seems to be of some value. The ultimate prognosis of this type, however, is grave.

### SUMMARY.

It is possible to distinguish the various types of paroxysmal rapid heart action (paroxysmal auricular tachycardia, paroxysmal auricular fibrillation and paroxysmal auricular flutter) one from each other and from normal acceleration by simple means that all physicians have with them at the bedside in the majority of instances. The points involved in the differential diagnosis are discussed and the importance of vagal stimulation as a life saving measure in rare instances is emphasized. The proper treatment of the various types of paroxysms will depend on the correct differentiation of the abnormal mechanism.

| Type of Paroxysmal Attack | Rhythm | Apex Rate | Effect of Vagal Pressure | Treatment |
|---|---|---|---|---|
| Auricular tachycardia | Regular | 140-250 ± | Attack ends or no effect | Vagal stimulation |
| Auricular flutter | Regular or regularly irregular | 140-175 ± | Temporary slowing, attack never ends | Digitalis |
| Auricular fibrillation | Absolutely irregular | 150-200 ± | Temporary slowing, attack never ends | Digitalis |
| Ventricular tachycardia | Essentially regular | 175 ± | None | General cardiac procedures |

# MEDICAL COMPLICATIONS FOLLOWING SURGICAL OPERATIONS.*

By William E. Preble, M.D., Boston.

It is with some hesitation and all due modesty that I venture to address this Society, many of whose members are surgeons, on a subject that at first thought seems well within the jurisdiction of the surgeon, rather than that of the internist. My excuse is a desire to call attention to some of the factors following surgical operations that are sometimes, I fear, lost sight of, because of the greater attention given to the operation itself, and its more immediate consequences. It has sometimes seemed to me that a little more care in regard to the condition of the patient before operation, and to his comfort, both before and after the operation, would be conducive to a minimum of suffering and a maximum of recoveries.

## POST-OPERATIVE NAUSEA AND VOMITING.

I will first consider the nausea and vomiting that to a greater or less degree are almost inevitable sequellae of major operations performed under a general anesthetic, such as ether or chloroform. There are various causes for this rather distressing complication, and the treatment varies with the cause.

1. The first and commonest type is caused by the direct irritation of the gastric mucosa by the anesthetic, and the consequent stimulation of the vomiting centre through the vagus nerve. This type is not serious, as a rule, and should be relieved in a few hours. Water, or water with a little bicarbonate of soda added, should be given freely. The patient is usually thirsty, and likes the water, and the vomiting paroxysm is less violent if there is something in the stomach to evacuate. Vomiting of this type should cease in a very short time, probably an hour or two at most.

2. Another cause of post-operative vomiting following laparotomies is too much handling of the abdominal viscera. Scudder has said that the organs should always be handled as gently as though the patient were conscious. The treatment of this type of vomiting is obviously prophylaxis.

3. A third cause of very violent long-continued, and sometimes almost uncontrollable vomiting is the lowering of the alkali reserve and increase of the H-ion concentration in the blood. This condition is commonly called an acidosis. It is of such common occurrence and so important a factor that I shall consider the condition in some detail a little later.

4. A fourth case of persistent vomiting is an acute dilatation of the stomach and small bowel, the so-called paralytic ileus. Too deep or too long-continued anesthesia, too much trauma to the stomach and bowel, acidosis, and surgical shock are some of the etiological factors. The vomiting in these cases is very frequent, usually in small amounts, and the paroxysms are not very violent. The patient is much prostrated. He looks sick. The treatment is prophylactic as far as the anesthesia and the operation itself are concerned. The immediate treatment is gastric lavage early and often. Pituitrin hypodermically or intravenously is indicated. Adrenalin is also recommended by some authorities. It is of the utmost importance to diagnose this condition early, as delay in treatment is frequently fatal.

5. Other causes of persistent vomiting that should be considered in certain cases are: uremia in chronic nephritis, induced by the shutting down of the kidneys because of irritation by ether or chloroform; mechanical stimulation of the vomiting centre in certain head injuries; direct stimulation of the vomiting center by the anesthetic; and visceral ptosis as a condition which for some reason is conducive to post-operative vomiting.

I will also merely mention strictly surgical accidents, such as obstruction or partial obstruction caused by adhesions or the catching of a loop of bowel in the wound.

A partial obstruction, especially if it is high up, may cause persistent and uncontrollable vomiting without giving the classical picture of obstruction. In these cases, diagnosis must be made by exclusion.

I want again to emphasize the point that in all cases of post-operative vomiting lasting more than a few hours, early diagnosis of the cause is of the utmost importance.

## SURGICAL SHOCK.

So much has been written in the past few years about surgical shock, and so many different theories have been advanced that any attempt to give even a complete résumé of the subject would take much more space than could be given in a paper of this kind. I will mention some of the later theories, and point out certain conditions that are considered by most authorities to be conducive to or causative of shock. Yandel Henderson's[1] theory of a lack of carbon dioxide in the blood as the cause of shock does not satisfy the known conditions. Cannon[2] in 1917 made a careful study of the known factors in shock that deserves mention. He assumes a stimulation of the vaso-motor centre by deficient circulation in the brain which causes a constriction of the peripheral arterioles. This forces the blood into the splanchnic system and it is trapped in the portal system between two sets of capillaries—that of the stomach, bowels, pancreas, etc., on the one side, and the capillaries of the liver on the other. Here the blood-pressure is so low that the blood is not forced through again into the peripheral circulation, and the patient bleeds into his own veins. The problem is to get the blood out of the portal system into the peripheral system. None of the ordinary stimulants have any effect. Porter[3], besides other valuable work on shock, evolved a new method of treatment. He makes use of carbon dioxide as a respiratory stimulant, increases the action of the respiratory muscles, and makes the patient pump the blood out of the portal system by increasing the negative pressure in the thorax. The $CO_2$ is administered by putting a box over the patient's head, and introducing the gas until the patient's respiratory rate is doubled, and his blood-pressure raised above the danger point. Still another theory advanced by Cannon as a result of his war experience is that some poison is formed in traumatized tissue that is carried through the blood and causes a toxemia which causes shock. It was noticed that soldiers wounded, for example, in the leg, would arrive at the hospital with a tourniquet on, and show no symptoms whatever of shock. As soon as the tourniquet was removed, they would promptly show symptoms of shock. Experimental work with rabbits seemed to confirm the truth of this theory.

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* Read before the Portsmouth, N. H., Medical Society, Oct. 5, 1920.

### CRILE'S THEORY.

Crile[4] has recently published a monograph on surgical shock that merits considerable attention. He considers that shock is merely a form of exhaustion, and is due to over-stimulation of the brain cells by excessive stimulation through the afferent nerves. This excessive stimulation may occur in a variety of ways, as from fear, anxiety, over-exertion, prolonged exposure to cold, starvation, trauma, infection, anemia, overproduction or excessive use of thyroid or adrenalin, etc. Inhalation anesthesia, and the trauma of the operation, are important factors. Definite pathological changes are found in the cells of the brain, liver, and adrenals, and these changes can be produced experimentally in animals. The changes are identical with those produced by exhaustion from any cause. Shock, then, has divers causes, or may be the end result of a summation of many contributing causes. There is an acute acidosis in every case of shock.

### TREATMENT OF SURGICAL SHOCK.

Crile says that experiments prove that none of the drugs ordinarily used as stimulants are of any use either as preventive or curative agents in shock, and that strychnine is actually conducive to shock, and in large doses will produce it. A 1-50000 solution of adrenalin administered continuously intravenously, 3 c.c. per minute, will usually maintain blood-pressure, but adrenalin in excess causes exhaustion,—and furthermore this treatment is impracticable.

Crile's treatment is under two headings: (1) Combat existing causes of exhaustion, and (2) Induce sleep, as sleep will repair the damage done to the brain cells, provided it is not too severe.

Under the first heading the measures are mainly prophylactic, and aim to eliminate factors conducive to shock, such as fatigue, worry, fear of operation, excess of anesthesia, malnutrition, acidosis, etc. If shock is actually present, combat the various causes expectantly,—

(1) Transfusion for anemia or hemorrhage; (2) keep patient warm; (3) relieve pain and suffering as far as possible, administering morphine, provided there is no cyanosis. This latter point is very important, as *cyanosis* means *acidosis*, and morphine prevents the normal recovery from acidosis, and tends to a persistence of the condition. (4) Thirst is relieved by the administration per rectal drip of a 5% glucose, 5% sodium bicarbonate solution. This also helps relieve the acidosis always present in shock. (5) Fear or anxiety should be overcome by reassurance and attention to little details of comfort. (6) Acidosis is combatted with fresh air, free fluids, oxygen if there is much cyanosis, and glucose-soda solution mentioned above by rectum, or, if necessary, intravenously. If

given intravenously, 500 c.c. every three or four hours, is given.

The second line of treatment aims to quiet the patient and induce sleep, as experiments on animals show that the damage to the brain cells provided it is not too severe, is repaired during sleep. Reassurance, allaying fear and anxiety, attention to physical comfort, and morphine in rather large doses, provided always there is no cyanosis, are the indications. Nitrous oxide and oxygen may be administered if morphine is contra-indicated.

Crile lays great stress on the kind of anesthesia to use. He says ether and chloroform block the efferent paths, but do not block the afferent; hence, stimuli caused by the traumatism of the operation are transmitted to the brain and tend to produce shock. Nitrous oxide-oxygen anesthesia blocks the afferent paths, as well as the efferent, hence tends to prevent shock. Blocking off the afferent paths by the use of novocain about the field of operation is indicated when ether or chloroform is used. He has shortened his old term, anociassociation, and applies the term *anociation* to his whole system of preventing surgical shock by prophylactic and other measures.

I have devoted considerable time to Crile's theories, because his main contentions are in accord with the work of other men who have studied various phases of this question: Porter's work already referred to; Mann's[5] work on anesthesia and surgical shock; Cannon's ideas as to the inefficacy of the usual drugs; and Mann's experimental work with the various solutions used intravenously; blood or blood serum being the most efficacious, and next to these a hypertonic saline with an alkali, glucose, and a colloid (such as acacia or gelatin) added to keep the solution in the blood vessels.

We would all agree with Crile's ideas as to the importance of preparation before operation and general post-operative care.

## ACIDOSIS.

Acidosis, or increased H-ion concentration in the blood and tissues, is a very common an sometimes a very serious post-operative complication. It is the most frequent cause of persistent vomiting, and is apparently always an important factor in surgical shock. The condition is frequently unrecognized, perhaps because we have been accustomed to diagnose acidosis by the odor of acetone on the breath or its presence in the urine. The presence of acetone and diacetic acid in the blood or urine are indicative of but one variety of acidosis. Indeed, I know of no simple bedside test by which we can infallibly diagnose acidosis. Increased respiratory rate, thirst, abnormally acid urine, and persistent vomiting without other obvious cause should make us consider the presence of an acute acidosis probable.

Our normal blood and tissue reaction is alkaline. It is impossible to live with an actually acid blood,, and Nature has provided a very efficient mechanism for maintaining the H-ion concentration at a very constant level.

Whitney[6] gave a very readable summary in an article published in the Boston Medical and Surgical Journal in 1917. For more detailed study, see the work of L. J. Henderson,[7] Palmer and Henderson,[8] Marriott and Howland,[9] Peabody,[10] *et al.*

The chief chemical elements involved are the three phosphates, the carbonates and bicarbonates, and free carbon dioxide. The albumins in the blood also tend to check any sudden change in reaction (Robertson[11]). When an excess of acid is thrown into the blood, as from severe exertion, fear, infection, etc., there is a shifting of H-ions, some of the alkalin phosphate becomes acid phosphate, the carbonates become bicarbonates, and some of these in turn drop their alkali radicals and release carbonic acid. This excess of $CO_2$ in the blood stimulates the respiratory centre, and the extra $CO_2$ is promptly eliminated through the lungs. The excess of acid phosphate is eliminated by the kidneys, and provided there is not an overwhelming amount of acid thrown into the blood, conditions return to normal in a few hours. It must be remembered, however, that $CO_2$ first stimulates, then depresses, and then paralyzes the respiratory centre, hence the danger in an acute acidosis.

Nephritics, diabetics, cardiacs with decompensation, patients with active acute or chronic infections of any kind, are almost certain to have some degree of acidosis. If surgery is necessary in these cases, we should remember that fear of the operation, the anesthetic if it be ether or chloroform, the abstinence from food immediately preceding and immediately following the operation, are all conducive to acidosis, and one or more of these factors may prove to be the proverbial last straw that precipitates a fatal acidosis or surgical shock.

### TREATMENT OF ACIDOSIS.

The treatment of acidosis includes (1) careful examination of patient before operation, with especial attention to the condition of the heart, kidneys, and respiratory tract. (2) Appropriate dietetic treatment, with free fluids, fruit juices and, if necessary, the exhibition of alkalies before the operation, if the patient comes in the class in which acidosis is known to be present. (3) After the operation, fluids and alkalies must be administered as soon as conditions will permit. Fischer's solution by rectum is a very efficient means of controlling the acidosis. (4) The diet should be laid out so as to give an excess of alkalies rather than acids, bearing in mind that the organic acids of fruits and vegetables increase the alkali reserve, while meats, cereals, and eggs carry an excess of acids. (5) Fresh air, oxygen, if necessary, soda-glucose solution, or Fischer's solution with glucose by rectum or intravenously, if necessary, are the list of valuable weapons in dealing with an acute acidosis.

One last point that should be borne in mind is the danger of giving too much alkali intravenously, if the kidney function is impaired, as a high concentration of salts in the blood may be as dangerous to life as the acidosis.

### CHRONIC CATARRHAL COLITIS.

Little is said in medical literature about chronic colitis as a late sequela of laparotomies, especially drained cases, yet it is quite common. The sequence seems to be—adhesions, interference with peristalsis, stasis, irritation of the mucosa, and obstipation. The patient may be constipated, but usually complains of diarrhea or alternating attacks of diarrhea and constipation. Scybala are passed at times, and mucus is found in the stools. Sometimes stools consisting entirely of mucus will be passed, usually preceded by colicky pain. The abdomen is usually tender over the site of the colitis, but there is no spasm. The x-ray shows the location of the trouble, the picture resembling somewhat that of tuberculous colitis.

Treatment includes irrigation of the colon once or twice daily with some non-irritating solution, such as normal saline with a little bicarbonate of soda added, and the exhibition of mineral oil or powdered agar-agar in fairly large doses. If the case is severe, rest in bed for a few days may be necessary. Immediate relief is usually obtained, but the trouble is prone to recur.

### MISCELLANEOUS.

If time permitted, there are various other medical complications following surgical operations that might profitably be considered.

The prevention and treatment of the various types of pneumonia—lobar, broncho, embolic, and hypostatic—deserve attention.

Acute oedema of the lungs, lung abscess following tonsillectomy, and the secondary anemia which so often follows a major surgical operation on the elderly patient, all furnish interesting material for consideration, but lack of time forbids further discussion.

REFERENCES.

[1] Henderson, Yandel: Carbon Monoxid Poisoning. Jour. A. M. A., 1916, p. 580.

[2] Cannon, W. B: The Physiological Factors Concerned in Surgical Shock. BOSTON MEDICAL AND SURGICAL JOURNAL, June 21, 1917, p. 859; A Consideration of the Nature of Wound Shock. Jour. A. M. A., Vol. lxx, 1918, p. 611.

[3] Porter, William T.: Shock. BOSTON MEDICAL AND SURGICAL JOURNAL, Feb. 15, 1917; Sept. 6, 1917; Aug. 22, 1918; May 8, 1919.

[4] Crile and Lower: Surgical Shock, 1920.

[5] Mann, F. C.: The Peripheral Origin of Surgical Shock. Bull. Johns Hopkins Hosp., 1914, xxv, p. 205; Monograph on Further Experimental Study of Surgical Shock, June, 1918.

[6] Whitney, James L.: Acidosis: A Summary of Recent Knowledge. BOSTON MEDICAL AND SURGICAL JOURNAL, Feb. 15, 1917, p. 225.

[7] Henderson, L. J.: The Theory of Neutrality Regulation in the Animal Organism. Amer. Jour. Physiol., xxi, 1908, p. 427: A Critical Study of the Process of Acid Secretion. Jour. Biol. Chem., ix, 1903, p. 403.

[8] Palmer and Henderson: A Study of the Several Factors of Acid Secretion in Nephritis. Arch. Int. Med., xvi, 1915, p. 109; Clinical Studies on Acid Base Equilibrium and the Nature of Acidosis. Arch. Int. Med., xiv, 1913, p. 153.

[9] Marriott and Holland: Phosphate Retention as a Factor in the Production of Acidosis in Nephritis. Arch. Int. Med., xviii, 1916, p. 708.

[10] Peabody: Studies on Acidosis and Dyspnea in Renal and Cardiac Conditions. Arch. Int. Med., xiv, 1914, p. 236.

[11] Robertson, T. B.: Jour. Biol. Chem., vi, 1909, p. 318.

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# THE BALNEOLOGY OF JAPAN.

BY HORACE PACKARD, M.D., F.A.C.S., BOSTON.

THE purpose of this brief article is to give a condensed survey of the mineral springs of Japan, dwelling cursorily upon their relation to volcanic influences; their healing qualities as handed down by tradition; their radio-activity as evidenced by recent tests; and their potentiality for usefulness.

Japan is a land of volcanoes and earthquakes. Happily most of the volcanoes are extinct, there being but seven, widely separated, showing but moderate activities and apparently serving as chimneys, smoke-holes or vents for the subterranean fires which smoulder below.

The province of Hakone which it has been my privilege to examine personally, is an ancient volcanic crater of an area of about sixty square miles. No volcanic activities have been known here within the memory of man, except a small vent hole in a cleft of the mountains from which pour forth considerable sulphurous vapors in considerable volume, accompanied with a growling sound, and irregular very brief earth tremors of considerable frequency, sometimes with force enough to shake buildings and rattle windows and accompanied with an indescribable grinding noise. These earthquakes have been known to the inhabitants for all time and are given no more thought and less solicitude than a thunderstorm with us.

Originally, far back in geological history this enormous crater of Hakone embraced a lake of large area, now much reduced in size by a deep drainage canyon which the waters of the Hawakawa river have cut through the eastern rim. Along this canyon for a distance of eight or ten miles hot springs crop out in many places and in great volume and some of these yield water at very nearly the boiling point.

About each one of these hot springs has grown up a little native village, the central feature of which is one or more native hotels or inns conducted for the convenience of those who desire to benefit by bathing in the natural hot spring waters. These native inns are very simple in construction, the floors consisting of thick straw mats closely fitted together and yielding a delightful softness to each foot fall, but devoid of all the comforts which appeal to the western world—no general assembly room, no chairs, no beds—each guest sits, eats, and sleeps on the floor, and each leaves his shoes at the door and enters the scrupulously clean hostelry in his stockings. In the first-class inns some of the guest rooms are delightfully artistic with their beautifully-grained selected natural wood finish, latticed windows, and takonomos, which furnish setting for a choice kakamono or exquisite bronze or porcelain ornament.

That there is a deep-seated conviction of the therapeutic value of these springs is evidenced by the vast numbers of Japanese people who flock to them year after year.

Before ever any chemical analyses had been made or tests conducted for radio-activity, fairly definite traditions had fixed the relative therapeutic value of the waters of the various springs.

Coincident with the Panama-Pacific International Exposition held in San Francisco in 1914 a volume* was published by the Government giving a list of all the then known mineral springs of Japan, chemical analysis of their waters and other interesting and valuable information. It is here shown that in Japan, an area less than our State of California, there are more mineral springs of traditional therapeutic value than in all the rest of the world together and the proportion of natural hot springs is greater than anywhere else on earth.

Here in Japan not much attention is bestowed upon cold mineral springs. The warm and hot springs are in great abundance and tradition has clothed them with enhanced virtues. It is estimated that there are more than five hundred hot springs in Japan and more than two thousand cold springs possessing marked mineral and radio-active qualities.

The potentialities of Japan as a balneological world sanitarium are beyond imagination. A range of volcanic mountains runs nearly the whole length of the Japanese archipelago from northeast to southwest for more than two thousand miles. It is mainly along these volcanic mountain slopes that the mineral springs are found. The natural environment of many of these springs is beautiful and interesting beyond words. Here in Hakone the mountain slopes are clothed with forests of cryptomeria and bamboo; nearly every hotel and villa has a cascade or brook or pool of running water; the upper reaches of the mountain are covered with waving billows of silver green bamboo grass, and attractive paths and trails lure to neighboring spring resorts, fascinating waterfalls, interesting ancient temples and viewpoints for glimpses of Fujiyama.

Hot springs are found at all altitudes from sea level to nearly seven thousand feet. At two places, at least, hot spring waters bubble up through the sands of the seashore. Other springs are located so near the sea with mountains sloping down to the water's edge, that the combined attraction of a popular hot spring resort with mountain and seashore scenery give added zest and recreation. In the fastnesses of the mountains are numberless hot spring places so far isolated from lines of travel that few patrons ever reach them from the outside world. Locally, for the people of the immediate countryside, they hold high repute and only await the construction of electric train lines or good automobile roads and modern hotels to receive the patronage of the world.

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* "Mineral Springs of Japan," edited by Dr. R. Ishizu of the Imperial Hygienic Laboratory. The writer wishes to acknowledge his indebtedness to the above for much of the information gathered in this communication.

As has already been hinted, *the hot springs* possess a popularity far in excess of the others, because of a tradition that the terrestrial heat which this bears to the surface imparts subtle healing and renewing properties not dwelling in spring waters which have been artificially heated. This probably has some foundation in the fact which recent radium studies have divulged regarding the evanescent character of radium emanations.

A tradition has long existed that the efficiency of a spring water as a healing agent is appreciably greater immediately at the source of emergence from the earth than at a point far away to which the water might be transported by a pipe or viaduct. Therefore at all the native hot spring resorts the bathing pools are so arranged that the waters flow directly into the baths by gravity and the volume, as a rule, is so great that a constant current of fresh output from the spring is flowing. It is intensely interesting to observe how these traditions are corroborated by modern findings in radio-therapy.

A favorite method of taking baths is by gravity douche where there is sufficient down grade in the land surface close to the spring to divide the outflow into the multiple deliveries through bamboo pipes from which the hot water drops several feet upon the person of the bather.

Slow sipping of the water at the time of bathing or just after, is much practiced, particularly of those spring waters having repute for gastric and intestinal disorders and also those carrying an appreciable content of radium emanations.

The practice at some of the springs is of taking many baths a day or long immersion, sometimes for hours at a time. Such prolonged immersion in hot waters has much traditional repute in nervous disorders. It is thus seen that long ere the adoption of prolonged bath-tub immersion was thought of as practical in our psychopathic sanitariums, it was an established method of hydropathic treatment in Japan.

Bathing at some of the more popular springs at time of greatest rush of guests is governed by almost military precision. At a given signal from the bath master the foremost line in the serried ranks of would-be bathers rush into the pool and immerse. After the lapse of a stated interval a signal bids them pass on out of the bath pool and the next line follows and takes its turn, and so on until the grist has all been through.

Critical comment has been made on the Japanese habits of bathing, in that many go into the same bath without change of water; but this seems based on inadequate knowledge of actual conditions, *e.g.*, it is the established custom for each bather before entering the pool to take what we call a "sponge bath" from a bucket or tub just at hand, thus cleansing his person before he enters the pool—the real bath being not for cleansing purposes but for the soothing and healing effects of the hot mineral waters.

Congregate bathing by the sexes formerly existed, we are told, but is never seen nowadays except at remote places. However that may have been or is now we are in no position to pass upon it for in all civilized countries at the present time congregate bathing at seashore, clubs and public baths is practised, the sexes associating with very abbreviated costumes and an exhibition of anatomy which leaves little to be imagined.

This paper would seem incomplete without brief mention of some of the most famous hot springs, their location and special features.

*Atami*, about three hours from Yokohama on Sagami Bay, stands foremost if judgment be based on the annual number of visitors. The last reports available at this writing show a total annual attendance of about 170,000. The special attractions are its accessibility from large centers of population,—Tokyo, Yokohama, Kyoto, and others; its salubrious climate of from a low 35° F. in winter to a high of 85° F. in summer; sheltering mountains on three sides and the fourth open to the sea; a geyser spring called "O-yu," or "Great Hot Water," which sprouts about every four hours. It is a saline radio-active water of about 200° F. The immediate environment is so arranged that nearly all the erupted water is saved in large pools for general bathing and distribution to neighboring hotels. Tradition gives climate and water high value for rheumatic and gouty affections and tuberculosis. It is now rather unpleasantly accessible because of poor and antiquated train-line transportation, but a new and up-to-date railway is under construction which will bring this part of the coast known as the Japanese Riviera into its own.

*Beppu,* on the island of Kyushu, is accessible from Kobe by a day and night's sail in a comfortable steamer through the Inland Sea. It is on a fine bay, with a crescentic beach, up through the sands of which percolate great volumes of hot spring water. Here patients are buried in the hot wet sand and great benefit is experienced in muscular rheumatism and neuralgic affections. In close proximity, but a little in shore is a geyser of boiling mud, the virtues of which are being exploited after the idea of some of the European mud baths. The reported number of visitors to Beppu Spa is about 108,000.

*Ikao.* This is one of the most popular hot-spring resorts, about sixty miles by rail from Tokyo. The waters contain iron and sodium sulphate and bear a temperature of 113° F. Therapeutic tradition gives these waters great repute for anemia accompanying menstrual disorders, therefore patronized largely by women. Annual number of visitors about 33,500. Altitude, 2500 feet.

*Senami.* This is a very popular hot spring resort near the coast on the Sea of Japan. It has an interesting history detailing its accidental discovery. Some years ago a well was sunk at this point hoping to "strike oil." When at a depth of six hundred feet and no oil was forthcoming, the project was given up. One of the interested parties, however, continued the boring at his personal expense. At eight hundred and thirty-seven feet something happened —not oil came, but a huge volume of boiling hot water shot ninety feet into the air. A flourishing hot spring bathing resort has grown up about this source and the waters have gained high repute for their healing qualities. It is estimated that the daily outflow is more than one million gallons.

*Arima* is easily reached from Kobe and Osaka and has been famous from time immemorable. The water is alkaline, contains iron, is salty to taste and turbid in color. Tradition gives this spring high repute for dyspepsia tuberculosis, skin affections, and anemia. Temperature of water about 130° F.

*Misara.* This rather isolated health resort is about 170 miles from Kyoto by train. Thirty separate springs of hot water gush out within a comparatively small area. The total outflow of water is enormous and it is one of the strongest in radioactivity. Its chief chemical ingredients are sulphur and carbon dioxide. It has traditional healing properties for digestive disturbances, hemorrhoids, menstrual disorders, rheumatism and neuralgia, and as a cardiac tonic. Its potentialities are evidently very great and it awaits only greater publicity and modern hotel accommodations to attain world-wide patronage.

*No-Bori-Betsu.* This is a hot spring of enormous delivery estimated at more than eight million gallons daily. It is situated in the north of Japan about a day's journey from Tokyo. Physical conditions are such that the gravity douche method is employed and is very popular, the patients standing under a stream of hot water coming through bamboo pipes direct from the spring.

*Yumoto* is one of the most attractive of the high altitude spring resorts over 5,000 feet above sea level on Lake Yumoto with a summer temperature of not over 82° F. It is reached by way of Nikko, known the world over because of its ancestral temples of the Shoguns in their setting of centuries old cryptomeria trees. The output of hot sulphurous waters is very large, coming from many springs and also bubbling up from the bottom of the lake. The waters from the different springs vary in temperature from 105 to 150° F. and are mildly radio-active.

*Dogo* is a very ancient hot spring resort, its early history merging into mythology. It is on the island of Shikoku near the Inland Sea, thirty feet above sea level. It was the resort of early emperors and ancient relics remain in the way of massive granite bathing pools and old temples. This health resort is visited largely by the inhabitants of southwestern Japan and the attendance averages about 45,000 annually.

*Kinossaki,* about 100 miles from Kyoto on the Sea of Japan, is also a very ancient hot spring place known since the seventh century. It has a very large outflow of more than 80,000 gallons daily, a temperature of 120° F. Its chief chemical constituents are lime, soda, and chlorine and it is mildly radio-active. Irrespective of the healing qualities of the waters which enjoy high repute, the place is noted for its beautiful scenery and salubrious climate. In the immediate vicinity are famous grottoes rivalling the bosaltic formations at Fringals

Cave off the coast of Scotland. The estimated number of guests annually is about 40,000.

Japan is at the cross roads of world travel. All Pacific steamers from all the North American ports touch at Japan. All the eastern traffic from European Atlantic and Mediterranean ports and all ships from Manilla and the Chinese ports come to Japan. All the travel over the Trans-Siberian Railway is closely in touch with Japan.

The future potentialities of Japan as a world sanitarium are beyond estimate. The five hundred and more known hot springs, many of them located in the midst of most romantic and beautiful surroundings are awaiting only the creation of comfortable transportation facilities and modern hotels of the highest order and adequate medical supervision. When these are forthcoming Japan will reap a richer harvest of summer tourists than Europe ever dreamed.

The only really attractive spring resort for foreigners at the present time is Miyanoshita, about fifty miles from Yokohama. Here is a sumptuous hotel fitted with all modern conveniences and conducted in an irreproachable way. The hundreds of other spring resorts are provided with native hotels, some of very high character and beloved of the Japanese, but very rarely patronized by foreign guests. Some offer "foreign rooms," which the prowling tourist may find comfortable enough for a transitory stay, but do not tempt one to prolong visits.

An estimate has been made of the volume of water delivered by some of the most important springs. It will be borne in mind that all of these are overflow springs, *i.e.,* the delivery does not depend upon raising the water by mechanical means from wells or subterranean pools. The spontaneous irrepressible delivery from some of the springs is unbelievable. Here at Miyanoshita the daily outflow is estimated at about twelve thousand gallons daily. From the total, Hotel Fujiya alone, takes enough to supply unrestricted baths to 120 guests, a pipe to the outdoor swimming pool, all the wants of the Hotel for general washing and cleaning purposes, radiators for heating all the general assembly and principal guest rooms and corridors, and heating coils for a green house. Five other native inns and houses are supplied with all their needs from the same source. The water is at the temperature of about 180° F. at the spring and 140° F. at the delivery faucets in the hotel.

This seemingly abundant supply is, however, but a "drop in the bucket" compared with the output from some of the really good springs. It is related of one hot spring that the outflow is so great and forceful that it is used to turn a mill wheel. The source of such volumes of water is an interesting question. The great number of "simple salt springs" suggests that the waters of the sea may percolate into the seat of the old volcanic fires and then under pressure of steam thereby generated be forced to the surface. It would seem also that there must be great subterranean pools under great pressure of heat or superimposed earth or both, ready to shoot their contents to the surface if but given a vent.

This brief mention of a few representative hot springs of Japan with cursory reference to their chief characteristics and variations in environment must suffice to stimulate the imagination as to the future possibility of this interesting corner of the earth.

Miyanoshita, Japan, August 9, 1920.

* * *

# REPORT OF A CASE OF CONGENITAL HEART DISEASE WITH COMPLETE AURICULOVENTRICULAR DISSOCIATION PRESENTING UNUSUAL FEATURES.

By F. A. Willius, M.D., Rochester, Minn.

[From the Section on Medicine, The Mayo Clinic.]

Case 332892. A young man, twenty years of age, was referred for cardiovascular examination by Dr. R. A. Barlow of the Section on Oto-Laryngology. In 1918, the patient had a mild attack of influenza without complications. Except occasional mild tonsillitis, he had had no previous illnesses.

The patient had been a full-term baby and apparently there had been no obstetric difficulties. He was a "blue baby," and the cyanosis was marked for the first two years. During the first year and a half he was very fretful and coughed a great deal. His development was somewhat retarded and he was considered by his parents to be a delicate child. Owing to shortness of breath he was unable to engage in the usual activities of other children. From early childhood clubbing of his fingers was noticed; this became progressively more evident until about the age of 12, after which little change was noted.

Examination revealed a slender, underdeveloped extremely cyanotic young man, whose color became almost purple on exertion. Clubbing of the fingers was marked and the toes were slightly clubbed. Cyanosis was most intense peripherally.

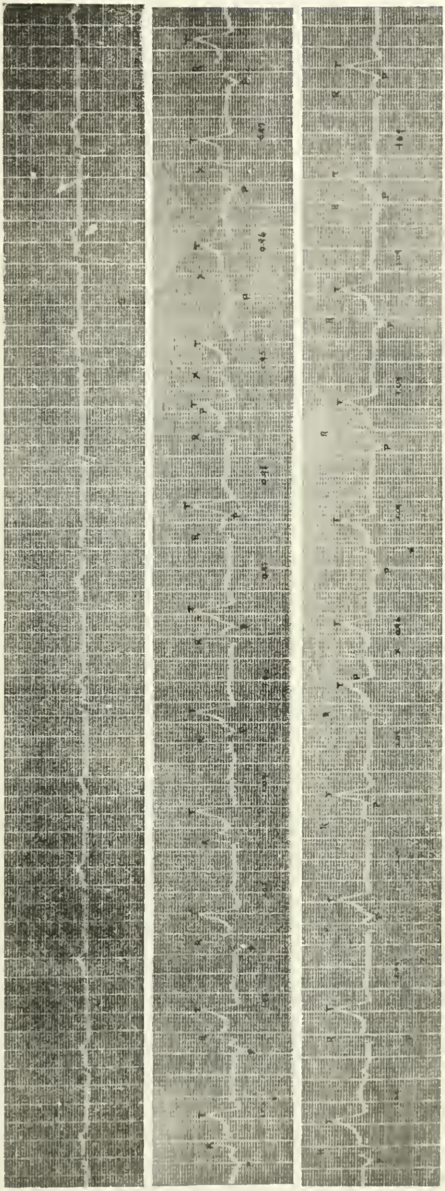
Dulness to cardiac percussion extended 3 cm. to the right of the midsternum and 10 cm. to the left. An extrasystolic arrhythmia was present. At the second left intercostal space near the sternum a systolic thrill, augmented by the premature contractions, was palpable. A loud rough, reverberant systolic murmur was best heard at this area; it was audible over the entire precordium, transmitted into the neck, especially into the left side, and toward the left shoulder. The murmur was audible in the brachial and femoral arteries. Jugular pulsations were visible. The liver was not palpable. There was no edema. The systolic blood pressure was 112 mm., the diastolic 82 mm. The blood examination revealed the presence of polycythemia, hemoglobin 95 per cent. (Dare), erythrocytes 7,400,000, and leukocytes 9,200. Differential count of 200 cells showed polymorphonuclear neutrophils 75, small lymphocytes 16, large lymphocytes 8.5, eosinophils 0, basophils 0.5. A roentgenogram of the chest showed the right ventricle to be dilated. Urinalysis was unimportant except for a very faint trace of albumin.

On examination of the nose and throat the tonsils were found to be moderately enlarged and containing plugs.

It is impossible to be dogmatic clinically with regard to the type of lesions in congenital heart disease but the anomalies probably present in this case were pulmonic stenosis associated with patency of the ductus arteriosus (Botalli). The fact that the murmur was transmitted into the peripheral vessels makes the latter anomaly a possibility at least.

DISCUSSION OF ELECTROCARDIOGRAMS.

The record shown in Figure 1 is of Derivation 1. Because of the low amplitude of deflection it is rather difficult to analyze the individual waves. Two consecutive premature contractions of ventricular origin were present. Preponderance of the right ventricle is evident.



Derivation I. Derivation II. Derivation III.

In the record of Derivation II (Fig. 2) the P wave is found to be inverted (negative), indicative, according to the consensus of opinion,[1, 2, 3, 4, 5, 6, 7, 8, 11, 13, 14] to a change in the location of the pacemaker. The probable region of impulse origin is the lower portion of the auricle. The auriculoventricular dissociation is at once apparent. A slight arrhythmia of the auricular rhythm is present. Throughout the tracings the P wave shows the tendency to occur sooner in each cycle. In the first cycle of Derivation II it occurs 0.19 second before the beginning of the R wave, in the second cycle 0.16 second, and in the third cycle almost coincident with the R wave. In the fourth cycle the P wave is absent but the S wave has an amplitude which is 3 mm. greater than that of the other complexes, indicating a superimposition. The fifth cycle reveals that the P wave occurs between R and T, slightly deforming the contour of the latter wave. The shifting relationship of the P wave to the other complexes is noted by following the tracing to its completion. Two consecutive premature contractions apparently of ventricular origin interrupt the ventricular rhythm. The interauricular cycles are somewhat diminished during this period although they remain so during the remainder of the tracing, indicating, I believe, no effect of the premature contractions on the auricular rhythm.

Owing to this progression of P wave occurrence the ventricular rate exceeds the rate of the auricles. In Derivation II the auricular rate is 61 and the ventricular rate 69. This is unusual in complete auriculoventricular dissociation.

Another striking feature of this derivation is the character of the T wave. It is markedly exaggerated and very peaked and not unlike the T wave in some of Smith's published electrocardiograms made following ligation of the coronary arteries. A T wave having such characteristics indicates, I believe, preponderance of contraction in certain areas of the ventricular musculature.[12]

Derivation III (Fig. 3) is not unlike Derivation II and may be analyzed similarly. The auricular rate is 57 and the ventricular rate, 63.

The occurrence of this unusual type of complete auriculoventricular dissociation with congenital heart disease presents the possibility that the disordered mechanism is also congenital. This question cannot be settled.

We were not afforded the opportunity of further electrocardiographic study of this case and regret greatly our inability to determine the effect of the vagus stimulation and atropin.

### SUMMARY.

1. A patient with congenital heart disease presented a very remarkable type of complete auriculoventricular dissociation.

2. The P wave was inverted (negative), indicating an ectopic focus of stimulus production.

3. An auricular arrhythmia was present, apparently not influenced by ventricular activity.

4. The P wave shows the tendency to occur sooner in each succeeding cycle.

5. An abnormal T wave was present in Derivation II and in Derivation III.

6. The rate of the ventricles was greater than that of the auricles.

### REFERENCES.

[1] Carter, E. P., and Wedd, A. M.: Observations on the Occurrence of Inverted and Diphasic P-waves in Lead III of the Human Electrocardiogram. Arch. Int. Med., 1919, xxiii, 1-16.

[2] Einthoven, W., Fahr, G., and de Waart, O.: Über die Richtung und die manifeste Grösse der Potentialschwankungen im menschlichen Herzen über der Einfluss der Herzlage auf die Form des Elektrokardiogramms. Arch. f. d. ges. Physiol., 1913, cl, 275-315.

[3] Goddard, C. H.: Changes in the P Wave of the Human Electrocardiogram. Arch. Int. Med., 1915, xvi, 633-643.

[4] Hamburger, W. W.: Clinical and Electrocardiographic Observations on Inversion and Other Anomalies of the P Wave. Arch. Int. Med., 1918, xxii, 8-27.

[5] Hering, H. E.: Rythmische Vorhoftachysystolie und Pulsus irregularis perpetuus. München. med. Wchnschr., 1914, lxi, 2057-2059; 2096-2099.

[6] v. Hoesslin, H.: Beobachtungen über den Einfluss des Vagus auf das menschliche Herz. Deutsch. Arch. f. klin. Med., 1914, cxiii. 537-570.

[7] Lewis, T.: Galvanometric Curves Yielded by Cardiac Beats Concentrated in Various Areas of the Auricular Musculature. The Pacemaker of the Heart. Heart, 1910-1911, ii, 23-40.

[8] Ritchie, W. T.: The Action of the Vagus on the Human Heart. Quart. Jour. Med., 1912-1913, vi, 47-70.

[9] Smith, F. M.: The Ligation of Coronary Arteries with Electrocardiographic Study. Arch. Int. Med., 1918, xxii, 8-27.

[10] Smith, F. M.: Experimental Observations on the Atypical Q-R-S Waves of the Electrocardiogram of the Dog. Arch. Int. Med., 1920, xxvi, 205-220.

[11] White, P. D.: Clinical Observations on Unusual Mechanisms of the Auricular Pacemaker. Arch. Int. Med., 1920, xxv, 420-428.

[12] Willius, F. A.: Clinical Observations on Negativity of the Final Ventricular Wave T of the Human Electrocardiogram. Am. Jour. Med. Sc., 1920, clx.

[13] Wilson, F. N.: Three Cases Showing Changes in the Location of the Cardiac Pacemaker Associated with Respiration. Arch. Int. Med., 1915, xvi, 86-97.

[14] Wilson, F. N., and Robinson, G. C.: Heart-block. I. Two Cases of Complete Heart-Block Showing Unusual Features. Arch. Int. Med., 1918, xxi, 166-175.

Osler Society for the Study of Medical History.—The Osler Society for the Study of Medical History has been organized by a group of twelve physicians of the Mayo Foundation. Dr. William C. MacCarty, associate professor of pathology, has been elected president of the society.

The New York Academy of Medicine.—In accordance with the conditions of the will of the late Dr. Abraham Jacobi, the New York Academy of Medicine has received a bequest of five thousand dollars and a library valued at $4,567.

# REPORT ON 64 CONSECUTIVE EXAMINATIONS OF THE DUODENUM ON THE CADAVER.

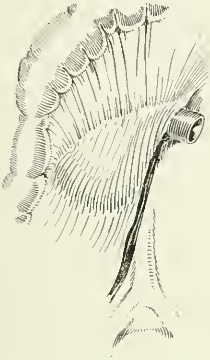


Fig. 1. 28.0%, 18 cases. This position corresponds with the descriptive text of the standard anatomies.

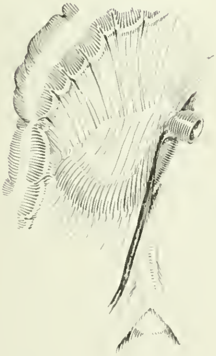


Fig. 2. 22.0%, 14 cases. The illustrations in the anatomical text-books frequently show a similar amount of ascending duodenum on the left side of the root of the mesentery. Fig. 1 and Fig. 2 may be considered as "Text-book normal."

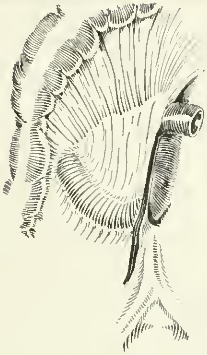


Fig. 3. 26.6%, 17 cases.

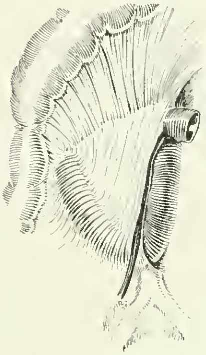


Fig. 4. 15.6%, 10 cases.

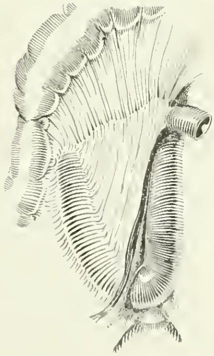


Fig. 5. 7.8%, 5 cases.

Fig. 5 shows the extreme position. The other four cases of this group were in intermediate positions between Fig. 5 and Fig. 4. In all cases the duodeno-jejunal flexure was in its reputed position.

H. F. Aitken.

# CONDITIONS IN PALESTINE DURING THE WAR AND MEDICAL RELIEF AMONG THE CIVIL POPULATION AND THE REFUGEES.*

BY IZAK ALCAZÁR, M.D., BOSTON.

*(Continued from page 48.)*

## THE FINAL BLOW IN PALESTINE.

The fall of Jerusalem completed the deliverance of the Southern Palestine. The principal cities in this area were: El-Arish, Gaza, Hebron, Bethlehem, Ramlah, and Jaffa. The remainder of Palestine comprise the Jordan Valley, with the cities of Jerico and El-Salt; Galilee in the north, with the cities of Jenin, Nazareth, Tiberias, and Saffed; along the costal plain, Haifa, Tyre, and Acka; farther north, Beyrut, the whole of the Lebanon region, with Damascus and Aleppo—all this territory was still in the hands of the Turk. Hardly any fighting was done after the conquest of Jerusalem in December, 1917, until the beginning of this drive.

The autumn of 1917 and the early winter of 1918 went hard with the allied forces in France, and the British were compelled to withdraw the major portion of their forces in Palestine and send them to the Western Front. During the early part of 1918 Palestine was inadequately protected. Had this fact been known the Turks could have recaptured Jerusalem and other cities without much difficulty. Furthermore, the British in the Jordan Valley were sustaining many losses from malignant malaria. But as soon as the tide in Europe commenced to turn in our favor, British, Hindu, Australian, and Italian troops were sent to reënforce the Palestinian armies. During this lull of apparent hostilities a great deal of elaborate preparation was secretly and steadily progressing for the complete extermination of the Turk and the German out of the Holy Land.

The preparation for this drive entailed a great deal of marching, and the troops, always moving by night, remained hidden in orange groves by day. Our air squadrons prevented the enemy observers from discovering any change behind our entrenchments. That the enemy remained mystified to the end is the finest tribute to the strategy of General Allenby and his Staff. Many of us who were in close touch with the British officials knew that the drive was about to be precipitated, and were expecting it every moment. The day of salvation finally arrived after many months of suspense.

It was on the 18th day of September, 1918, at 4.30 in the morning. The enemy was suddenly stunned by the violence of the uproar which announced the beginning of the battle of Sharon on the West, where I was stationed for duty, and by another blow that was struck simultaneously in the Jordan Valley, and by the third attack launched at Samaria in Central Palestine. Every gun in each of these sections was fired off punctually as if by the pressure of an electric button. The roar of the artillery and infantry sounded and felt like a succession of thunder bolts and earthquakes combined. It was pandemonium let loose. The Western section met with so little resistance in most places that our men were overtaken by the fire of their comrades in the rear. The cavalry went dashing ahead upon the rear flanks of the enemy and scattering them in disorder. The infantry went over the top ahead of time and made its way towards the enemy entrenchments before the Turks and the Germans could put down a barrage, and in almost every case the shells of the enemy burst a long way in the rear of our army. The sight of the Hindu soldiers in this battle, with their dishevelled black shining hair, with fixed bayonets or with a knife between their ivory teeth, demanding, with blood in their eyes, a Turk or a German to murder,—was to me more terrifying than the blast of the cannon. The fleeing Turks found no mercy from the machine guns or bombs of the air raiders. This aerial combat will remain with me as one of the most wonderful of all spectacles I beheld during the war. It was done at such low altitudes that their maneuvers could be discerned very distinctly. I saw the pilots shoot forth their yellow darts, performing meanwhile their feats of zigzagging, looping the loop, and other stunts to outwit and dodge the enemy's fire, at the same time inflicting their fatal blows. Our flyers dropped in one day eleven tons of bombs and fired thirty-six thousand rounds of bullets. The air was quickly freed from German and Austrian flyers. In this section the enemy found its Armageddon.

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* On the 25th of May, Dr. Alcazár sailed for Palestine the second time to open an eye, ear, nose, and throat hospital for the needs of the civil population. The plan is to establish the hospital in Haifa and hold clinics in the surrounding villages, one in Nazareth and one in Acca. The chief feature of the work will be to educate the natives as to the contagious nature of trachoma and in prophylactics.—*Editor.*

At the close of the first day there were captured 230 guns, 25,000 prisoners and three hundred transport vehicles.

The Germans and the Austrians tried to forsake the Turks and escape; they ran like wild rats that were set on fire, but the advancing British Army pursued them furiously and hemmed them in on all sides. Thousands of prisoners passed through the cages at night, and with few exceptions, they were very thankful that their misery was over.

This is but a brief description of a part of this remarkable drive which passed under my observation up to noon of the first day. The battle continued eighteen days until the British reached Aleppo.

When my own work began, I saw nothing but the wounded, dead and dying on every side. The field ambulances were running to and fro over the battlefield, bringing in the wounded faster than they could be cared for. During this time bullets and shrapnel went whizzing by my tent. Strange how one gets accustomed to dodging missiles of death on the battlefield! I felt little or no fear. My only thought was how quickly I could help the poor fellow before me and make room for the row of stretchers that was waiting without my tent —a row that never grew shorter but was continually extended.

I followed the Army to Haifa, a distance of about forty miles. Upon arriving there I was ordered to return to the main hospital, for the number of head and brain injuries was increasing rapidly. When I arrived there I found work for at least one month. I was in the hospital every morning from eight to twelve, and in the afternoon from four to six, constantly operating. At the end of the third week I succumbed to sand-fly fever and took to my bed.

Upon recovery, I resumed my clinic and hospital work for the civil population and the refugees at Jaffa.

### CONDITIONS OF THE REPATRIATED REFUGEES AND THE RELIEF WORK DONE AMONG THEM.

After the Final Drive the refugees left the towns and villages to which they had been driven by the Turks and returned to their former homes.

These exiled people presented a serious problem. They were penniless. Many of them found their homes wrecked, the majority were suffering with either malaria, pneumonia, influenza, tuberculosis, or typhoid, and most of them with trachoma. Homes and food had to be provided for them, medical aid had to be administered; for these people suffered long and had been shamefully neglected.

Turkey had declared war against the Allies, but in reality she was waging war against her subjects. Exposure, poverty and destitution produced a peculiar illness known as "Starvation Disease," which was particularly manifested in children. I saw them by the hundreds daily wandering about in the streets and in my clinic, emaciated, anemic skin, sunken cheeks, contracted chests, distended abdomen and bow legged, and their bodies covered with sores, thus presenting a ghastly picture which will haunt me for the remainder of my life.

Wherever the Turks went they succeeded in draining not only the blood of the inhabitants, but also the vitality of the soil, and when they were forced to abandon a place and flee to a more secure shelter they left their last abode a veritable scene of desolation, so that when the British captured it they found it morally and economically in ruins,—cattle, crops, and even the seeds had been consumed. There was no ambition left for the peasant to plough his field or to prune his vineyard. The shepherd remained in his hut rather than take his flock to graze on the hills or in the valleys. Fields were therefore left uncultivated, cattle or sheep were scarcely seen in any of the conquered territory, and even the few forests and the sparsely planted gardens were stripped of every tree to furnish fuel for the military locomotives and for the kitchens of the Army. Palestine depends on the outside world for nearly 70% of its needs. The land produces no coal, oil, cotton, and very little wool. There is no lumber of any kind. Potatoes, rice, peas, beans, sugar, coffee, tea, every article of clothing, household utensils, and countless other commodities must be imported. For the need of its six hundred thousand inhabitants, Palestine can produce only wheat, barley, fruits, vegetables, poultry and cattle. Isolate such a land from the outside world and it can be imagined what dire distress there is created in one year even in normal times. How much more distressing the situation becomes when the devastating hand of war is laid upon it and with a Turkish rule that sought to destroy its own people.

It devolved upon the British Government to import seeds, cattle and merchandise from Egypt, to sell, loan, and to distribute to the peasants as the case justified itself, assuring them that the government would buy all the crops and cattle that they could afford for sale and at a good price. Forthwith the Arabs came out with their old-fashioned ploughs of Bible times, the shepherd was heard piping his flute to his flock on the hills of Judea and Galilee, and by the brooks in the valleys, and signs of life were thus seen everywhere. Until the people could earn enough to maintain themselves, relief camps were established in many centers. Suitable work was provided for thousands of refugees, thus enabling them to earn a living instead of being dependant upon charity. Road mending, interpreters for the business of the government, clerks, policing and burden carriers, the manufacture of souvenirs and fine embroidery furnished to many a means of livelihood. These articles found a ready market among the officers and soldiers. Despite all these efforts on the part of the government and philanthropic contributions from America there is still in Palestine great poverty and misery.

The eye condition of the refugees was exceedingly grave. Ninety per cent. of them had trachoma; 50% were acute cases, and 20% showed injury to vision, requiring some sort of an operation for the amelioration of their condition. Of the adults 7% were hopelessly blind. Fifteen per cent. of the children had permanent injury to their vision. I saw trachoma in infants two weeks old. Some of these little tots had such severe infection with ulceration of one or both eyes causing a perforation of the eye ball with complete evacuation of its contents, the result of which is absolute blindness. It was heart-rending to be forced to tell the parents that the case before me was helpless. Many of these refugee children had been bereft of both parents during the war; others have been left without a single relative—death had wiped away whole families. Many an orphan had been picked up by some kind woman whom the child had learned to call mother or grandmother. It was a terrible sight to note the sad expression on the faces of such kind-hearted women when they would hear from my lips that no medical assistance could be rendered to their protegés. Among these refugees there were hundreds of children without a home. I saw them seek shelter at night under naked—nothing more upon their bodies than a be expected, they were dirty and practically naked—nothing more upon their bodies than a little garment made of sackcloth which was the worse for wear and still the worse for filth.

I did not dare to ask these little children to return the following morning with their parents to receive instructions for the care of their eyes or ears. The answer would invariably be: "Father went to war two, three or four years ago and we have not heard from him, and mother is sick in bed." I once asked a child to bring his aunt with him. The little fellow did not know what I meant. He was one of the many unfortunates who had lost every relative during the war. The number of orphans among the Mohammedans and Christians was appalling. The Jews suffered no less, but they founded several orphanges which cared for their own in a most commendable manner. But the orphans of other nationalities are still homeless and are suffering many privations. My heart goes out to them in pity and sympathy.

It was impossible to harden one's feeling against the little sufferers. I realized that they required immediate relief of food, clothing, shelter and a mother—or some woman with maternal instincts—to care for them just as much as they needed urgent medical treatment.

Among the repatriated refugees there were hundreds of women who had been made widows by the war. Their husbands, brothers or sons who had maintained them were either dead or far away, engaged in the bloody business of war. I conceived a plan to assist a few of these destitute women and at the same time rescue some of the orphans wandering about the streets. Many kindly women were found who were willing to board and care for these little ones, and with the assistance of kind patients and friends in America I was enabled to secure homes for a few orphans until some one was found to care for them more permanently. The satisfaction of being the means of saving the lives of many of these poor children will remain with me as the greatest joy of my work in Palestine. To most of these women it was a God-send. They took the little ones into their homes as well as into their hearts, veritably replacing their own children whom they had lost during their wanderings. A woman once said to me, placing her hand upon the head of her adopted child, "But for this comfort my life would have been lonely and unbearable."

It is sad enough to see children dying of starvation; that in itself is sufficient cause to rob one of sleep and selfish happiness, but more pitiable is it to see them go blind for life for lack of efficient, persistent and vigorous treatment against the common enemy of Egypt and Palestine, *viz.*, trachoma; that grips the heart as in a vise and will not let it go.

*(To be continued.)*

## THE DUTY OF STATE MEDICAL SOCIETIES.

By R. C. Fish, M.D., Worcester, Mass.

Like all great questions that the public and governments have to meet, oftentimes questions of exceedingly momentous importance, often necessitating the most exquisite sense of discretion by legislators and statesmen, the medical profession is rapidly approaching a crisis in its affairs.

The status and position of the State Medical Society is somewhat in jeopardy. Its function of being purely an organization where men meet both surgeons and physicians, to discuss and exchange ideas and opinions on all subjects associated with the medical profession has been compelled to submit to an exploratory incision and examination.

It has often been a question, in my way of seeing things whether the Massachusetts Medical Society has ever really seen its duty toward the profession, other than the fellowship and association purposely to exchange opinions on medical and surgical matters. That is — the duty the Massachusetts Medical Society owes to the profession of the State of Massachusetts, relative to the legislation that should be enacted by the State of Massachusetts in the interest of the profession.

It has also a duty of having sufficient interterest through its district societies in the appointment or selection of trustees of all public hospitals. Business men may be business like and administrate according to their business ideas, but when the fairness and the interests of all men in the profession are to be considered, they are exceedingly flimsy props and weak minded administrators to lean upon.

Trustees of corporate hospitals are not any better administrators nor any more fair in the rightful distribution of things than those as the head of public hospitals. All of them seem to have an obscure vision of things when the minority of the profession who have not been favored with any sort of appointment, should be taken into account in regard to their chances of having an opportunity to enjoy at least some share in the different stages of digestion.

May I ask those who read this article to follow me, and I will endeavor to point out —that is to say, as I think it should be—"The Duty of a State Medical Society"?

The moment any society accepts dues or fees from any individual or individuals, that society assumes an obligation. The obligations are those of consideration relative to their interests. You will notice that I say "their interests"; *their* does not mean those having staff surgical appointments and staff medical appointments, or those having out-patient appointments, nor those having school, factory, city and state appointments—these men have been taken care of in a way, that is, they are in line for something to be thought of as better, whatever it may be.

Then there is the lodge doctor with his many calls and a great many, no doubt, for nothing, because he has sold himself into that sort of bondage for a per capita head fee. As you will see, *their* means not only the above-mentioned surgeons as well as all other doctors, but also that minority of men in the profession, especially in cities where the cost of living is high, who have nothing but their diplomas and wits with which to *get by*. The sparing distribution of what remains is exceedingly meagre.

Would it not be a happy suggestion for the Massachusetts Medical Society to select a committee to call upon the lodge doctor regarding the abuse of his license? The societies that employ the lodge doctor are composed to a certain extent of the public. The public that we hear so much about, wishes and desires and has a right to expect a square deal, yet that same public should and must be brought to realize that by employing lodge doctors it is not extending that same square deal to a portion of the medical profession, but is contributing largely to their pecuniary distress.

Hospitals, in open competition with the general practitioner, are also accomplishing, with the aid of their well meaning, although not farseeing trustees, the very same circumstances. Whose duty is it, if it is not the duty of the State Medical Society, to assume the responsibility of equalizing the professional opportunities? Not as a charity; no one accuses the State Medical Society of charity. But is it not rather the seeking of a square deal for the minority, than a mere form of charity as seen through the eyes of those who have lived their professional careers amid the glory of affluence? The maternity wards and private rooms of the hospitals of the city of Worcester render service to about two thousand cases yearly, then there are several men in the profession who gather in two or three hundred a year.

Had we medical men instead of business men as trustees of our public hospitals, as well as corporate hospitals, there would be a possibility of a more and general consideration of the profession in general. As it is, things seem to be for those who are favored, or unfortunately imposed upon. The medical fraternity may understand things better than the business men, therefore let us have a change; we may breathe more freely.

The Massachusetts Medical Society has indeed a magnanimous duty toward the betterment of the non-appointed portion of the medical profession or what may be termed the minority. I mean by non-appointed, that part of the members of the medical fraternity who have no assistance from any source whatever:

1. Its duty to suggest the better regulation of the profession by sincere and effective legislation.

2. Every legislative act pertaining to the profession should be considered pro and con, the extent that it may affect the incomes of those whom legislation for the public good may be likely to affect most. It would be the nonappointive portion of the profession.

3. In cities with adequate hospital protection, etc., one physician to ten or fifteen hundred people can readily do all the work that he may be called upon to do.

Let us realize for an instant that there are lodge physicians who have two, three and four lodges and their families to care for, that is, twenty-five hundred to three thousand people. The estimate of one to ten or fifteen hundred is reasonable.

### LEGISLATION PERTAINING TO BOARD OF REGISTRATION.

Dr. Frothingham of Boston suggested before the Worcester District Medical Society the idea of annual re-registration. It is an excellent idea. Excellent in the fact that it would arouse from their lethargy a great many men of the non-appointed portion of the profession to the realization that they are still members of the medical fraternity.

"The combing out process of the poor doctors." Another suggestion of Dr. Frothingham, one that we need a boundless amount of light upon. It may be well for one and all to bear in mind the many intricacies of legislation, that is, whether it is to be a process of elimination or license discontinuation of those long in the service of the profession. Let the profession safeguard itself by at least believing that "Government is obedience to that form of law enacted only by legislatures, senates, assemblies and parliaments." Boards and committees are appointive or selective and not elective bodies, therefore their work is along the path of suggestive legislation and of performing their duties relative to legislation already enacted.

There should be an act of legislation giving the Board of Registrars the power to compel all men who are licensed, that all unfair lodge practice must cease, and that doctors establish themselves on the same equal opportunity. Manufacturers also ought to be brought to realize that there are others dependent upon public patronage. It is as well that men employed by the many industrial organizations, as doctors and surgeons, cease their work with the day's work and that the injured individual should be given the right to select whomever he may choose thereafter to care for him. The manufacturer ought also to realize that there are those in the profession for other purposes than wasting time.

Legislation relative to a better and more complete medical education, thereby increasing the term from four years to a five years' course, and the sixth year for practical interne work. I would suggest preliminary requirements—those of a high school certificate and the full university or collegiate course. An act of legislation for the above would benefit everyone. Those who enter the profession after us would easily be the ones to profit infinitely by it. Such an act would improve the standing of the profession, help everyone now in the service of professional work for the good of the public. It would also be the means of many men entering more useful vocations than by selecting an incomplete medical training, hurrying through it, etc. The one so doing starts immeasurably below men of more complete and longer training The advantages would be many:

1. Men would start on the same level.
2. Proper regulation of doctors in proportion to population.
3. The avoidance of wasted or useless lives and the unhappiness brought about by meagre living.

It is up to the Massachusetts Medical Society and the American Medical Association to get in touch with the American Association of Medical Colleges. By so doing a more complete understanding may be accomplished.

## Book Reviews.

*A Study of the Epidemiology of Tuberculosis*, with Especial Reference to Tuberculosis of the Tropics and of the Negro Race. By George E. Bushnell, Ph.D., M.D., Colonel United States Army (Medical Corps), retired; Honorary Vice-President and Director National Tuberculosis Association; Member American Climatological and Clinical Association. New York: William Wood & Co. 1920.

The name of Colonel Bushnell, the author of this book, will be familiar to all medical men who served in the tuberculosis department of the Army in the late war. Under his guidance the almost incredible task of examining every recruit for tuberculosis before going overseas was accomplished and, as a result, of all the deaths in the expeditionary forces only 2.3% were from tuberculosis. To designate tuberculosis as an epidemic disease may seem strange to one who knows it in this part of the world as a chronic endemic one, but Colonel Bushnell shows in this volume by an analysis of a large mass of epidemiological data, collected from tropical countries and elsewhere, that tuberculosis, when it occurs among people who have never been exposed to the tubercle bacillus before, acts like an epidemic disease both in its rapid spread and in its acuteness. From a consideration of the facts collected from widely scattered sources the author concludes that there are two different manifestations of tuberculosis—one, the primary form—occurring in persons who have had no previous immunizing infection—a form not only different in its progress but in its pathology; and the other—the fibrocaseous form—as observed in civilized countries, which is, as the author believes, not caused by a new or recent infection but rather the recrudescence of a previous infection acquired in childhood, hence its generally slow progress and tendency to heal. In remote regions, such as the interior of Africa or the Islands of the Pacific, untouched by civilization, tuberculosis is comparatively rare, but when it does occur, through the coming of some bacillus carrier, it may spread like any other epidemic and becomes an acute and rapidly fatal general infectious disease. The chronic form in these regions is rare or unknown. It is an infection upon a "virgin soil" as with the infant with us. The history of tuberculosis among the North American Indians, as the author shows, is very similar to that among the non-tubercularized tropical natives. With the negroes, however, Colonel Bushnell believes that they were largely tuberculized while in slavery and that their greater mortality over the white race, after they obtained their freedom, was due to their unhygienic mode of life and excesses, rather than to a new or primary infection. Neither geographical position, race, climate or sanitation influences, the author believes, to any great extent, the difference in the incidence and clinical course of tuberculosis in the tropics but rather the fact that the native inhabitants of these regions were not protected by a previous benign infection. We have, then, according to Colonel Bushnell, the two great classes, the immunized, who have received a protective infection, consisting of all civilized peoples; and the non-immunized, the unprotected native peoples, and infants and very young children in the civilized nations. That "practically all civilized adults, even the most healthy, have undergone a tuberculous infection," Colonel Bushnell believes to be a fact, proved by observation at autopsy, by the Von Pirquet test and by radiography on the healthy subject. This fact, he declares, is of hardly less importance in phthisiology than the discovery of the tubercle bacillus. The belief formerly held before the discovery of the tubercle bacillus, that consumption was not infectious, contains an element of truth, the author says, in that it is not infectious for those who have already a tuberculous infection, even though it be occult.

"Optimal immunization until 100 per cent. become immune is the wished-for goal," in our present state of civilization, the author declares. As a result of these studies in the epidemiology of tuberculosis, Colonel Bushnell makes several practical suggestions; first, that we should lay less stress upon the danger of adult infection and more upon that of the non-immunized young child; second, that we should improve in every possible way the health of the community so that a fortunate initial infection shall not be impaired and converted into manifest and dangerous disease; third, that tuberculosis workers and associations might well undertake the task in their various communities of testing the children by the cutaneous tuberculin test, as has recently been done with a limited number of children in the Framingham Demonstration, such tests to be continued for a series of years. The procedure is simple and with a little instruction any intelligent layman could do it. The collection of such a series of facts would be of extreme value, Colonel Bushnell believes, both for guidance in prophylaxis and treatment, and for statistical information. This would seem to be a feasible new piece of work for local tuberculosis associations to undertake. Colonel Bushnell writes from great personal experience in dealing with tuberculosis and a deep study of its problems, and coming from such a source, this book is a very valuable and unusual contribution upon a subject which is receiving so much attention by investigators the world over. Although one may not accept the conclusions arrived at by the author as definitely proved, yet it must be confessed that, in the present state of our knowledge, they best explain the facts, gathered from all parts of the world, relating to the various forms and manifestations of tuberculosis.

*Diseases of Children.* By John Lovett Morse, A.M., M.D. Third Edition. Boston: W. M. Leonard. 1920.

The third edition of ''Diseases of Children,'' of the Case History Series, has been issued. The first edition, published in 1911, was printed three times; the second, revised and enlarged, was twice printed; the present edition follows the general plan of the first two, but has been revised to contain the methods of diagnosis and treatment which have proved to be most successful since the publication of the previous edition. There are presented two hundred case histories selected to illustrate the diagnosis, prognosis, and treatment of the diseases of childhood, with an introductory section dealing with the normal development and physical examination of infants and children. In this third edition the author has amplified the Table of Growth during the first four years, inserted a Blood Pressure Table, and added comments on congenital obliteration of the bile ducts, cephalhematoma, and obstetric paralysis, with directions for serum treatment. The section on the gastroenteric tract has been rewritten; cases have been presented to illustrate indigestion from excess of breast milk, artificial food, fat in breast milk and in artificial food, sugar, maltose, and starch, and to illustrate infections caused by dysentery bacillus. A chapter has been added to explain home modification of infant foods and the determination of their composition and value; directions have been given for the use of neosalvarsan and mercurial treatment; new material on whooping cough and the value of vaccine treatment has been added. There is presented also in this edition discussion of acute nephritis, with improved tables of food values, Edebohl's operation for nephritis, methods of treatment of emphysema of the lungs, of enuresis, and of tetany. The author has given his experience in the treatment of infectious meningitis due to pneumococcus, of infantile paralysis, diabetes mellitus, and diabetes insipidus. In addition to these main subjects of revision, the third edition shows careful study and editing to make the book a complete and up-to-date text-book on pediatrics.

*Diseases of the Nose, Throat, and Ear.* By W. S. Syme, M.D., F.R.F.P. and S.G., F.R.S.E. Edinburgh: E. and S. Livingstone. New York: William Wood and Company. 1920.

An excellent handbook on the diseases of the nose, throat and ear has been written by Dr. Syme for the benefit of students and practitioners. The work is based on the author's own experience and observation, recorded in a concise and practical manner for the purpose primarily of stimulating interest in this special field, the importance of which is often inadequately emphasized in training courses. Methods of examining the nose, the pharynx, and the larynx are described in detail, with excellent plates to illustrate the text. In the section dealing with the nose are considered affections of the external nose and of the vestibule, rhinitis, the nasal septum, nasal growths, epistaxis, and nasal neuroses. Methods of treating diseases of the nasal accessory sinuses are considered, and instructions are given for performing the intra-nasal antral operation and the radical antral, or the Caldwell-Luc, operation. The author has outlined operative procedures for dealing with diseases and tumors of the pharynx and the larynx. One section of special interest deals with syphilis, tuberculosis, and lupus of the nose, pharynx, and larynx. The two methods of direct examination of the upper air and food passages,—one by suspension pharyngoscopy and laryngoscopy, the other by direct laryngoscopy, bronchoscopy and oesophagoscopy, are clearly described and will be of value to practitioners. Careful consideration is given to the affections of the ear and their treatment; the importance and usefulness of x-ray examination in connection with suppurative conditions in the nasal accessory sinuses is explained. In an appendix are given formulae for local anaesthetics, lotions, caustics, mouth and nasal washes, pigments, sprays, drops for the ear, inhalations, insufflations, and ointments. The book gives an unusually clear and practical presentation of an important subject.

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## ALL AMERICA CONFERENCE ON VENEREAL DISEASES.

The All America Conference on Venereal Diseases and social hygiene was held in Washington last month, the call to it having been sounded by women before the International Health Conference at Cannes, France, in April, 1919. The delegates there, who represented the five allies who fought in the great war, called for regional conferences to take up the work; and of these the meeting in Washington was the first.

The second will be held next May at Copenhagen, Denmark, and will be attended by representatives of all the Scandinavian nations and by Holland and Great Britain. Later conferences will probably be held in 1921 at Paris and at London, and one or both of these will be attended by delegates from Germany, which before the war did much against the twin diseases.

The meeting in Washington was generally agreed by all who attended its sessions to be one of the most remarkable medico-sociological gatherings ever held in the United States. This was probably a result of the plan on which the conference was organized and carried on; for this differed markedly from that of the usual medical convention. No set papers, such as commonly occupy most of the time, were read; and the few set speeches that were prepared were almost completely done away with by unanimous consent.

The work was directed by the General Conference Committee, originally planned to number fifty, but later expanded to more than one hundred, selected from the four hundred and odd delegates by Dr. William H. Welch, president of the conference. The effort, largely realized, was to gather in this committee those who, by their studies, experience, and other attainments and by their relations to other official and non-official bodies, could speak with authority on the many phases of the work. Its membership included clinicians, pathologists, sociologists, syphilographers, gynecologists, social workers, psychiatrists, and others.

Split into twelve sub-committees, each of which had a special group of problems to consider, the committee worked long and hard. The problems were presented to them in the form of questions which had previously been prepared by the administrative committee. One by one the answers were worked out, often after long effort which harmonized views that at first appeared to be divergent.

Lunch time brought rest but no escape for the members of the conference committee. The organization did not permit them to scatter, but took them for automobile rides to points of interest and then brought them back to the hotel in time for lunch, immediately after which came the hour for reassembling. The result was that the afternoon sessions began promptly with a full attendance. Some delegates remarked plaintively that they had never worked so hard in all their lives before, "but," they added, "your methods of organization most assuredly do get fine results."

The committee resolved itself into a committee of the whole for the afternoon sessions and discussed *seriatim* the reports that had been reached by the twelve small groups in the morning. Naturally, many of these reports were warmly debated, for the viewpoints of the different classes of the membership were very different. The medical and the psychological men, for instance, often disagreed at first, only to find cause later to modify their *ex parte* ideas considerably in the light of those advanced by the others. And so, also, of other groups and members. The results of such debates often proved to be invaluable.

While the morning and afternoon committee meetings were going on, the remaining delegates, some 300 in number, assembled in the auditorium of the United States National Museum to listen to set papers; but, after the second day, these were reduced by common consent to a minimum and, in their place, were taken up matters raised by the delegates themselves. Many such debates resulted in the formulation of new questions for submission to the general conference committee.

In the evening the delegates met again and received the findings of the general conference committee, many of which were warmly debated. Members of the committee were on hand to defend their action; but not a few resolutions were referred back to them for further consideration, which ultimately resulted in harmonious agreement and invariably in considerable improvement.

The resolutions reached by the conference are not yet available. They were submitted to the delegates and passed upon as they were reached by the conference committee and not in the order propounded; and they can be presented to the profession only after considerable editorial labor. The work has already been begun and will be pushed to early completion.

The general form of the manner in which some of the questions have been answered is shown by the following resolutions adopted by the conference:

In reply to a question as to the establishment of immunity to gonorrhea and syphilis, the Committee presented the following resolution: "With reference to gonorrhea, there is no evidence of the establishment of any immunity to disease beyond that of the more or less temporary immunity in the case of existing individual infections. Such a temporary relative immunity may be lost either as a result of disturbed relations between the infecting organism and the host or through the introduction of a new gonorrheal infection.

"With reference to syphilis, there is no evidence of an absolute and permanent immunity to syphilis unless it be that due to an existent infection. There is evidence to show that infection may exist without obvious manifestations of the disease. The immunity ensuing in such an infection may extend even to the degree of a commensal or symbiotic adaptation."

With respect the the use of the Wassermann reaction, among other things, it was resolved that: "The blood Wassermann reaction should not be used as a sole guide to the duration of a syphilitic infection. The blood Wassermann reaction should not be used as the sole evidence of the effectiveness of a particular drug or method of treatment. The blood Wassermann reaction should not be used as the sole evidence of 'cure,' no matter how many times repeated."

Of interest to laboratory workers and clinicians is the resolution that: "The complement fixation test has not yet been shown to be of value in the diagnosis of doubtful cases of gonorrhea. It is possible, however, that the precipitin test recently reported by Meader and Robinson may be of great value."

The committee enumerated some of the advantages of having venereal disease clinics operated in conjunction with other clinics, and pointed out that such a plan promotes recognition by the public that venereal diseases are being dealt with exactly like other diseases. It also pointed out that under this plan the treatment of venereal diseases in the same institution with other diseases promises a better understanding on the part of young physicians, especially among interns and medical students, regarding the importance of these diseases and of the true relation established between them and other pathological conditions.

In promoting education with respect to the venereal diseases, it was resolved that: "Fear should not be deliberately stressed as a deterrent. The element of fear should appear only to the extent that it is inherent in the presentation of the facts themselves. Any morbid tendencies resulting from such unavoidable fear should be corrected by positive and constructive teaching as to the prevention and cure of the disease."

In dealing with Law Enforcement it was resolved that: "The establishment and maintenance of high standards of sex conduct is the best protection of public health from venereal diseases . . . That up to the level of the highest standards which can be sustained by public opinion, laws penalizing the promotion of and the indulgence in illicit sex relations constitute sound and practicable public health measures."

In dealing with sex offenders it was resolved that: "The establishment of reformatories with standard equipment for examination, classification, training, recreation and parole is the most hopeful method of rehabilitating the old offender."

The psychological aspect of the venereal disease problem, at least in one of its phases, was touched upon in the following resolution: "Although there is danger that a superficial and erroneous interpretation of the Freudian psychology in regard to the repression of the sex instinct may be detrimental to the successful development of the program of the control of venereal disease, a more thorough going, complete and scientific interpretation, however, tends to aid such a program in that it places the emphasis upon the practical means for guiding the sex instinct into socially useful and constructive activities."

The committee emphasized the importance of social service, recreational facilities and measures for dealing with feeble-minded delinquents and a host of other questions.

Exhibits and demonstrations were features of the work of the conference. Included in these were the methods of the United States Hygienic Laboratory in testing salvarsan, the application of the methods of social hygiene by the Washington police, and the methods of treating venereal diseases at the United States Naval Hospital. Among the exhibits were wax models of the Army Medical Museum, showing phases of venereal disease and the social hygiene car for educational work now in use in North Carolina was brought to Washington for inspection by the delegates.

Among the 400 delegates at the conference were representatives from Argentina, Brazil, Chili, Ecuador, Cuba, Honduras, Mexico, Paraguay, Porto Rico, Canada, Czecho Slovakia, and England.

## MEDICAL NOTES.

Award of Distinguished Service Medal.—A distinguished service medal has been awarded by the United States War Department to Colonel Antoine DePage, surgeon-general of the Belgian Army, for his valuable assistance to the medical officers of the American Expeditionary Forces.

Smallpox in Hayti.—A report received from Hayti on November 27 states that smallpox is epidemic there. One private in the American Marines has been sent to the hospital, and emergency tents have been erected in the belief that there will be about a dozen more cases in the brigade. Nearly five hundred native cases are being treated for smallpox in the hospitals.

Public Health Service Institute.—The recent announcement of the U. S. Public Health Service of its intention to hold an institute, at which health officers and physicians will receive ten-day intensive courses in the latest and best methods of dealing with venereal diseases is meeting with enthusiastic responses from State Boards of Health and other organizations and persons. A recent letter from the Indiana State Board says, that Indiana cannot afford to miss the Institute and will send several official representatives, supplemented by many unofficial ones. The Institute will open on November 22 for 10 days and will be immediately followed on December 6 by a six-day session of the great All-America Conference, at which the most eminent physicians, administrators, and other experts of the western hemisphere will discuss the best ways of fighting the twin diseases.

U. S. Public Health Service Hospitals and Tuberculosis.—Several of the largest general hospitals of the U. S. Public Health Service are being provided with special facilities for the diagnosis of tuberculosis and for the study of patients to determine which Public Health Service Hospital is best suited to their needs. These hospitals will become clearing houses for the diagnosis and placement of tuberculosis patients in their vicinity, especially for those with doubtful diagnosis or with complications requiring expert care. At each of them physicians skilled in this specialty will be on duty and the most modern methods will be in use. All Public Health Service Hospitals, however, are open to tuberculosis cases; and admission is never denied because of lack of special facilities. Special centers are already functioning in the Public Health Service Hospitals at Fort McHenry, Baltimore, Md.; Fox Hills, Staten

Island, New York; and Hospital 35, St. Louis, Mo. Other centers will be organized as soon as possible.

Nervous and Mental Patients in the Marine Hospital.—The U. S. Public Health Service will soon convene in Pittsburg a board consisting of Dr. A. J. Ostenheimer, of Philadelphia, Dr. T. Diller of Pittsburgh, and the officer in charge of the Marine Hospital to arrange for the setting aside in the hospital of a section for the diagnosis of neuropsychiatric patients from the third district of the Service, comprising the states of Pennsylvania and Delaware.

Enlargement of Hospital at Tucson.—The U. S. Public Health Service is enlarging its hospital at Tucson, Ariz., so as to provide for 200 more patients than it now accommodates, and for the necessary increase in hospital personnel. The enlargement is necessary to accommodate the large increase in the number of patients in this vicinity.

Recruiting Nurses.—Owing to the impending lack of trained nurses to staff the new hospitals that are being opened by the U. S. Public Health Service, the superintendent of nurses will make an effort during her pending tour of inspection to obtain recruits to fill the vacancies. Public Health Service Hospitals exist in all parts of the country and offer opportunity for patriotic service in the care of soldiers disabled in the great war.

Specialist to Visit Tuberculosis Hospitals.—Surgeon-General H. S. Cumming, of the U. S. Public Health Service, is determined to see that every one of the 15,000 tuberculosis patients in the Public Service Hospitals shall have the best treatment to be had in any hospital in the land. To make sure that they shall miss nothing, he has requested a number of eminent specialists in tuberculosis, not members of the Public Health Service, to visit all service hospitals and to study the conditions at each with a view to standardization and to making any improvements that may suggest themselves. Doctors David Lyman of Wallingford, Conn., Victor Cullen of the Maryland State Sanitarium, and Martin F. Sloan of Towson, Md., will officiate in the eastern states; Dr. George Thomas Palmer, Springfield, Ohio, in the central states; and Dr. Henry Hoagland and one or two others in the southwestern states. About two weeks will be spent in each hospital.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending January 8, 1921, the number of deaths reported was 211 against 255 last year, with a rate of 14.53 against 16.45 last year. There were 23 deaths under one year of age against 45 last year.

The number of cases of principal reportable diseases were: Diphtheria, 75; whooping cough, 14; scarlet fever, 47; typhoid fever, 2; measles, 54; tuberculosis, 50.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 4; typhoid fever, 1; measles, 2; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 1; scarlet fever, 4; measles, 1; tuberculosis, 12.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 4.

◆

## The Massachusetts Medical Society.

### OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Chosen by the Council, June 8, 1920.

*President:* Alfred Worcester, 751 Main St., Waltham 54.

*Vice-President:* Frederick Ellis Jones, 1150 Hancock St., Quincy 69.

*Secretary:* Walter L. Burrage, 42 Eliot St., Jamaica Plain 30.

*Treasurer:* Arthur K. Stone, Auburn St., Framingham Center.

*Librarian:* Edwin H. Brigham, 8 The Fenway, Boston 17.

### STANDING COMMITTEES.

On Arrangements.—C. H. Lawrence, Jr., Donald Macomber, A. W. Reggio, J. B. Swift, K. G. Percy, F. J. Callanan.

On Publications and Scientific Papers.—E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

On Ethics and Discipline.—J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever, F. W. Anthony.

On Membership and Finance.—S. B. Woodward, Algernon Coolidge, Jr., Samuel Crowell, Gilman Osgood, Homer Gage.

On Medical Education and Medical Diplomas.—Channing Frothingham, C. F. Painter, J. F. Burnham, A. G. Howard, R. L. DeNormandie.

On State and National Legislation.—Alfred Worcester, F. G. Wheatley, E. H. Stevens, F. E. Jones, J. S. Stone.

On Public Health.—E. H. Bigelow, Annie L. Hamilton, E. F. Cody, Victor Safford, R. I. Lee.

## OFFICERS OF THE DISTRICT MEDICAL SOCIETIES, 1920-1921.

Elected by the District Medical Societies between April 15 and May 15.

Barnstable.—C. P. Curley, Provincetown, *President;* P. F. Miller, Harwich, *Vice-President;* C. J. Bell, Wellfleet, *Secretary;* H. B. Hart, Yarmouthport, *Treasurer;* E. E. Hawes, Hyannis, *Librarian.*

Berkshire.—A. P. Merrill, Pittsfield, *President;* G. P. Hunt, Pittsfield, *Vice-President;* O. L. Bartlett, Pittsfield, *Secretary;* C. T. Leslie, Pittsfield, *Treasurer.*

Bristol North.—H. G. Ripley, Taunton, *President;* Sumner Coolidge, Middleborough, *Vice-President;* A. R. Crandell, Taunton, *Secretary;* R. D. Dean, Taunton, *Treasurer.*

Bristol South.—E. D. Gardner, New Bedford, *President;* A. I. Connell, Fall River, *Vice-President;* A. J. Abbe, Fall River, *Secretary and Treasurer.*

Essex North.—D. D. Murphy, Amesbury, *President;* F. W. Snow, Newburyport, *Vice-President;* J. F. Burnham, Lawrence, *Secretary and Treasurer.*

Essex South.—W. G. Phippen, Salem, *President;* Loring Grimes, Swampscott, *Vice-President;* G. E. Tucker, Salem, *Secretary;* G. Z Goodell, Salem, *Treasurer;* C. M. Cobb, Lynn, *Librarian.*

Franklin.—J. A. Mather, Greenfield, *President;* E. C. Thorn, Deerfield, *Vice-President;* F. A. Millett, Greenfield, *Secretary and Treasurer.*

Hampden.—J. M. Birnie, Springfield, *President;* M. B. Hodskins, Monson, *Vice-President;* H. L. Smith, Springfield, *Secretary and Treasurer.*

Hampshire.—S. A. Clark, Northampton, *President;* A. J. Bonneville, Hatfield, *Vice-President;* E. E. Thomas, Northampton, *Secretary and Treasurer.* F. E. Dow, Northampton, *Librarian.*

Middlesex East.—C. L. Sopher, Wakefield, *President;* G. F. Dow, Reading, *Vice-President;* A. E. Small, Melrose, *Secretary;* Richard Dutton, Wakefield, *Treasurer;* G. W. Nickerson, Stoneham, *Librarian.*

Middlesex North.—E. J. Welch, Lowell, *President;* W. M. Jones, Lowell, *Vice-President;* J. Y. Rodger, Lowell, *Secretary;* T. B. Smith, Lowell, *Treasurer;* P. J. Meehan, Lowell, *Librarian.*

Middlesex South.—H. T. Baldwin, Chestnut Hill, *President;* E. H. Bigelow, Framingham Centre, *Vice-President;* F. B. M. Cady, Cambridge, *Secretary;* Edward Mellus, Newton, *Treasurer.*

Norfolk.—G. W. Winchester, Mattapan, *President;* C. D. Knowlton, Roxbury, *Vice-President;* Bradford Kent, Dorchester, *Secretary;* G. W. Kaan, Brookline, *Treasurer.*

Norfolk South.—E. H. Bushnell, Quincy, *President;* F. E. Jones, Quincy, *Vice-President;* C. A. Sullivan, South Braintree, *Secretary, Treasurer, and Librarian.*

Plymouth.—F. J. Hanley, Whitman. *President;* R. B. Rand, North Abington, *Vice-President;* W. C. Keith, Brockton, *Secretary, Treasurer, and Librarian.*

Suffolk.—F. B. Lund, Boston, *President;* J. W. Bartol, Boston, *Vice-President;* R. H. Miller, Boston, *Secretary;* D. J. Bristol, Jr., Boston, *Treasurer;* W. P. Coues Boston, Librarian.

Worcester.—F. H. Baker, Worcester, *President;* J. J. Goodwin, Clinton, *Vice-President;* G. A. Dix, Worcester, *Secretary;* G. O. Ward, Worcester, *Treasurer;* A. C. Getchell, Worcester, *Librarian.*

Worcester North.—C. E. Woods, Lunenburg, *President;* R. S. Ely, West Townsend, *Vice-President;* C. H. Jennings, Fitchburg, *Secretary;* F. H. Thompson, Jr., Fitchburg, *Treasurer;* L. F. Baker, Fitchburg, *Librarian.*

# Correspondence.

## THE WINTER CLIMATE OF LUGANO.

(From our Foreign Correspondent.)

Hotel Villa Castagnola,
Lugano (Cassarate), Switzerland,
November 23, 1920.

*Mr. Editor:*—

I enclose the translation of an article upon the winter climate of Lugano which recently appeared in the *Zürcher Zeitung*, the leading Swiss newspaper, and hope you will find space for it in your columns, as I think it will be of interest to all physicians who are interested in climatology.

Although I have not yet passed a winter here, I have talked with numerous Swiss medical men about the climate, and with a still greater number of the laity, and, from all I have heard, I believe that this article does not exaggerate its virtues. There is certainly much more sunshine here than in most other places in Switzerland, and the air is delicious. As for the landscape, it certainly leaves little to be desired, and the beauty of the atmospheric effects must be seen to be appreciated. It is certainly a wondrously beautiful view that one gets, wherever one looks. I expect to remain here until the late spring, and so shall have opportunity to form a personal judgment concerning the climate.

Very truly yours,
Henry W. Kilburn, M.D.

### Translation of an Article in the "Zürcher Zeitung" of November 12, 1920.

The spring in Canton Ticino, coming, as it does, in all its floral splendor, at a time when, on the other

side of the Gotthard, the storms of winter are still raging, is as much taken as a matter of course, and is as much glorified in poetry and prose as is the autumn, which latter season lends a peculiar beauty to the Lugano landscape; for it clothes the mountains surrounding the lake in the most varied garments, and paints the shimmering lake a sparkling blue, while on the mountains and hills, the grapes are ripening, and the noble chestnut trees are dropping their delicious fruit. It is at these two seasons of the year that Lugano is most frequented by people who need to recuperate; but it must be admitted that these guests often return home greatly disappointed because it is by no means rare for long continued periods of rainy weather to give the lie to stories about the ever blue sky of Italian Switzerland. On the other hand, Lugano is too little valued or frequented as a *winter* resort, notwithstanding the fact that it is precisely at this season of the year that the "weather" remains "settled" to an extraordinary degree, and almost never provides unpleasant surprises.

The winter climate of Lugano is highly thought of by medical authorities all over the world, and has been recommended for numerous ailments and for various conditions of exhaustion; but the fact that Lugano is little frequented during the months of December, January and February shows that the general public is insufficiently informed as to its winter climate.

The Lugano winters are preëminently distinguished for their great number of sunshiny days. Professor Ferri, the Lugano meteorologist, after 30 years of observation, has established the following as an average number of days of sunshine during the winter months:

| | |
|---|---|
| November | 12 |
| December | 17 |
| January | 17 |
| February | 17 |
| | 63 |

It will be seen from these figures that, on the average, every second day of winter is one of sunshine, and hence gives opportunity for outdoor air and exercise; and it is unnecessary to call attention to the great benefit this means to those who are trying to regain their strength. Incidentally, it may be remarked that no other Swiss health resort surpasses Lugano's record for sunny days. To all this may be added the mild temperature, which rarely sinks below the freezing point, and which never shows those violent changes which often render a sojourn on the Italian Riviera dangerous to invalids. The mean winter temperature is as follows:

| | |
|---|---|
| November | 43.2° |
| December | 36.2° |
| January | 34.3° |
| February | 38.3° |

The normal precipitation during these months ranges from 2.1 inches to 2.6 inches. Snowfalls are very rare, and fog is almost an unknown feature of Lugano's winter climate. The entire winter resembles early spring. Even though, here and there, a fall of snow occurs, it generally disappears in a few hours. The air, to be sure, is not warm and moist, like that of the tropics, but is relatively dry, and there are no annoying winds. From these Lugano is well protected by its surrounding mountains. The water of the lake is a good regulator of temperature.

All these things give Lugano's winter climate a great similarity to that of the Mediterranean coast, without the drawback of violent changes of temperature such as occur there. Hence, olive, laurel, fig and cypress trees are enabled to withstand the winter. On the cliffs of Gandria one finds the agave; and other species of plants that, elsewhere, thrive only on the shores of the Mediterranean coast, are to be found in the magnificent natural park lying between Gandria and Castagnola. In the district about Lugano, primroses bloom as early as January, and are soon followed by violets. Often as early as February, the almond trees are in full blossom, and are exquisitely beautiful; while at the same time, magnolias and camellias unfold their petals.

A prominent medical man, well versed in the winter climatic conditions of Lugano, says: "The Lugano winter climate possesses something of the stimulating and reviving effects of that of Meran, and something of the tranquilizing effect of that of Montreux. Upon tissue building, the appetite, food assimilation and blood making, it has a gently stimulative effect, and a tranquilizing effect upon the nervous system."

The *Bäder-Almanach*, which is published by prominent German *savants*, speaks as follows in regard to Lugano:

"The climato-therapeutic value of the winters which, as a rule, are dry and beautiful, with glorious, windless, sunny days, is, as yet, too little known and appreciated. The winter climate of Lugano is particularly suitable for the strengthening of delicate constitutions, both in youth and old age, and for convalescents and those who need to recuperate."

It is the experience of innumerable physicians that the climate of Lugano in winter has not only a recuperative effect, but a healing one. There are, as is well known, certain catarrhal conditions which require, not the dry air of the high mountains, but air that is slightly moist, like that of Lugano in winter. Other ailments for which, according to a renowned physician, the air of the Lugano winter is very well suited, are those of the heart, and all diseases accompanied by an increased blood pressure. The great number of walks with only a gentle ascent, which is to be found here, is of great assistance in these cases. Also, the food in the Lugano hotels and pensions generally includes a large proportion of vegetables, and this assists in the work of restoration.

Then, too, in diseases of the digestive organs, the mild but stimulating air has a salutary influence. After pleurisies accompanied by the formation of firm adhesions, in emphysema, and in circulatory disturbances, the most surprising results have been attained. Nervous invalids, who are fatigued by town life, and who are not seeking fashionable distraction, but rather the refreshing rest of nature, will find this climate a great recuperative force—a force which is greatly enhanced by the charm of the landscape. To everyone who has seen the winter in Lugano, it is a spectacle never to be forgotten. Down in the valley is the fresh green of the meadows and of tropical trees and plants, many of which, like the Japanese mistletoe, blossom even in the winter; and this wealth of vernal freshness is surrounded by snow-capped mountains—the Tamaro range to the west, and the dolomite peaks of the *Denti della Vecchia* to the east; while to the north, the flat summits of the Camoghè group complete an encircling rampart open only to the south. This contrast lends a peculiar charm to the winter landscape, and is a delight to the eyes of those who ascend, by dry and snow-free paths, the hills which surround the town. There is an additional charm at the hour when the last rays of the setting sun bathe in rosy light the slopes of Monte Brè, while savage Monte San Salvatore towers menacingly toward the sky, its dark mass forming a deep contrast in the picture.

The Boston Medical and Surgical Journal

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## New England Surgical Society

### "MEGACOLON."

By W. E. Ladd, M.D., Boston.

The disease with which this paper has to do has been given various titles, among which may be mentioned, "Giant Colon," "Hirschsprung's Disease," "Neuropathic Dilatation and Hypertrophy of the Colon," "Congenital Idiopathic Dilatation of the Colon," and "Megacolon."

Of these, "Hirschsprung's Disease" seems to me to have little to recommend it, Hirschsprung having no claim to priority in discovering the disease, numerous articles having appeared on the subject during sixty odd years prior to his first paper in 1886. Also it is always preferable to adopt a descriptive title when possible. In the light of our present knowledge, "Congenital Idiopathic Dilatation of the Colon" is the most comprehensively descriptive title yet suggested.

"Megacolon," the title which will be used in this paper, is quite satisfactory providing it is not confused with pseudo-megacolon, a disease of the adult. Broadly speaking it may be said that this disease is one of childhood only, though it is possible that occasionally a patient may reach adult life with this condition. Most of the cases, however, reported in the adult do not give a history of dating back to infancy and many have demonstrable mechanical reasons for the dilatation. Such cases have been classified by Finney and others as "Pseudo-Megacolon," and are not considered here.

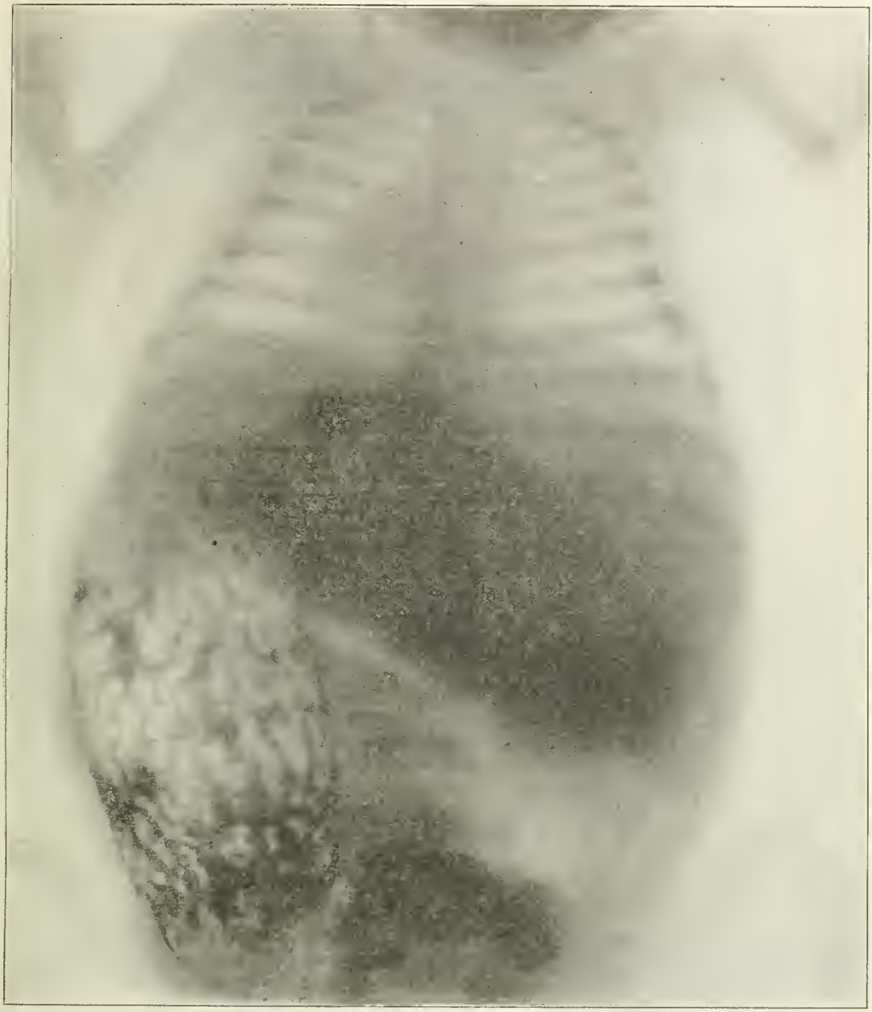
That the disease is congenital in origin seems well established as several cases have been reported during the first few days after birth and at least one in a seven months foetus. The cause of the disease is still a matter of theretical speculation. Treves believed the dilatation and hypertrophy to be due to actual obstruction. Two objections to this theory occur to me, first, that numerous writers who have reported cases have failed to demonstrate any actual obstruction either at operation or at postmortem examination; secondly, that in my experience, at least, patients suffering from actual obstruction such as imperforate anus, or imperforate anus with small fistulae or congenital ano-rectal stricture do not have megacolon. Hawkins suggests some neuro-muscular defect causing a paralysis of one segment of gut with consequent collection and backing up of feces. Finney believes that his microscopic findings with all muscular and nerve elements present, disprove this theory. But the fact that, in my experience and that of others, the resultant shock from resections of megacolons has been much less than might be expected in an operation of this magnitude or in similar operations for other conditions, suggests that Hawkin's theory is worthy of further investigation. Until such investigation throws more light on this subject, the condition may be considered as an anomaly of development.

Pathological findings show an enormously dilated and hypertrophied colon, the affected part beginning and ending abruptly, the sigmoid and descending colon being the portions most commonly involved, though occasionally one sees the whole colon from the rectum to the caecum enlarged. The small bowel is not involved and does not become distended even when the colon has tremendous fecal retention. The mesocolon has been in all my cases unduly long and without the extreme thickening mentioned by others. The intestinal wall of the affected portion is two or three times thicker than that of the unaffected gut. Microscopically, the thickening is shown to be due largely to the hypertrophy of the mucosa and muscular layers with some increase in connective tissue. In cases of long duration, that is, in older children ulcerations of the mucosa and consequent inflammation have been found, this, occasionally even extending to the peritoneum.

Clinically, the story is usually one of constipation from birth or soon afterwards, the most important feature of the constipation being the long periods of time in which there is no bowel movement without evidence of acute obstruction. The periods between defecation having been often several days and occasionally even weeks. Sometimes, however, the bowels may move daily when there is still tremendous fecal retention. This is explained by the liquid part of the feces passing by large masses without dislodging them. In such cases it may take repeated enemata and cathartics to empty a megacolon even when the patient has been apparently suffering from diarrhea. It is common during the course of the disease, when the toxemia or auto-intoxication becomes particularly great, to have periods of vomiting and accentuated abdominal distention. At times the distention may become sufficiently great to encroach on the diaphragm causing dyspnoea or cardiac embarrassment or both. These periodic attacks of vomiting with increased abdominal distention should be taken seriously and measures adopted for their relief as not infrequently the patients die during them.

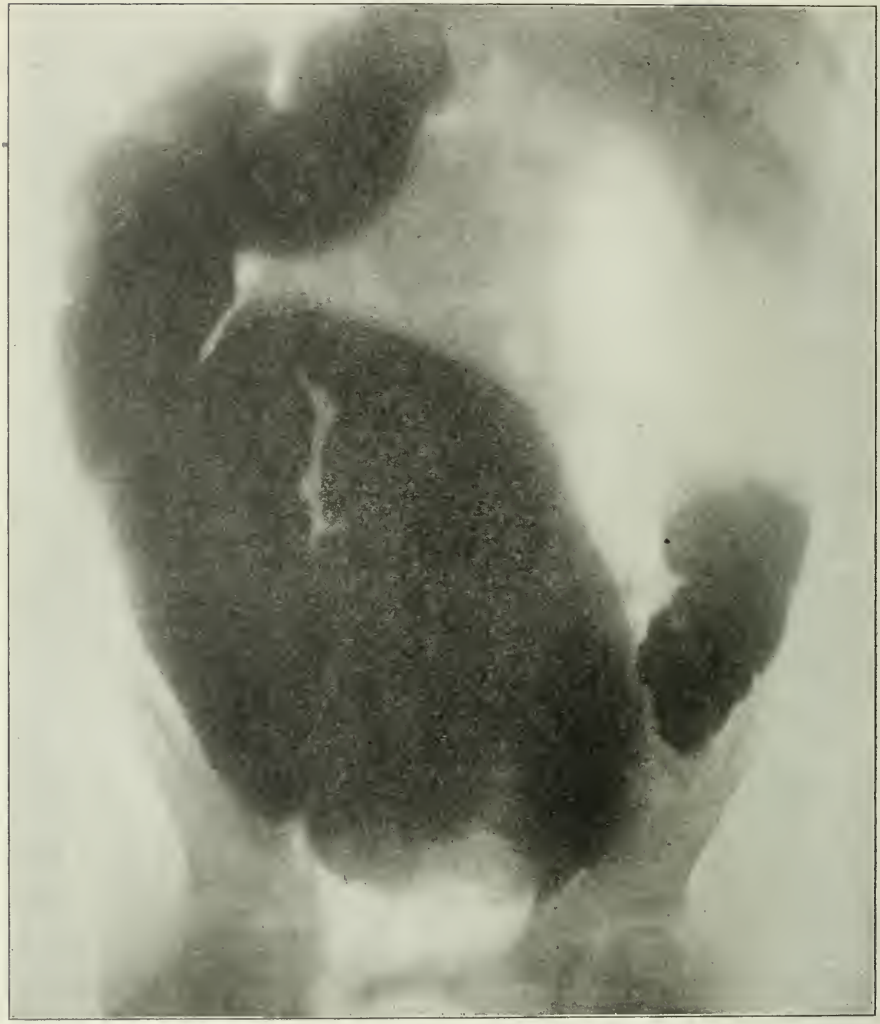
On physical examination, one finds an emaciated child with a very prominent abdomen, the angle of the costal margins unduly wide and the diaphragm higher than normal; the veins of the abdominal wall dilated and conspicuous; the coils of the dilated colon can be seen and large freely movable masses felt within them. Though peristalsis may be seen at times, it is usually sluggish and often not apparent. In the patients I have seen, the distention has been least in the right upper quadrant and epigastrum and most marked in the left lower quadrant. The skin over the abdomen is stretched and smooth but in other parts of the body, loose and dry, with the complexion sallow and the facial expression inclined to be dull. Add to this picture, the obtaining of copious stools of clay-like consistency and foul odor, by means of enemata and catharsis and one feels confident of megacolon as a correct diagnosis. The diagnosis should always be confirmed by a radiograph of a bismuth clyster. Among other conditions which give rise to a prominent abdomen in children may be mentioned chronic indigestion with constipation, rickets, tubercular peritonitis, and acute obstruction. But the complete picture is quite different in each of these and mistakes in diagnosis should be indeed rare, especially if the x-ray is resorted to when there is doubt.

Having made the diagnosis of megacolon, the question of treatment arises. Upon going to the standard textbooks one finds rather an unusual situation, Keene and other surgeons recommending medical treatment, while in Dunn, Rotch and other medical books, one finds surgery advocated. This suggests what, on more extensive analysis proves to be the case, that no treatment yet discovered is always successful. Medical treatment may be said to be the treatment of constipation. Various diets have been recommended but apparently a diet with a small residue is the most advantageous. Besides diet, active cathartics, mineral oils, enemata of various sorts, massage, electricity, supportive belts and exercises have been tried, and should be tried on all border-line cases and if successful, obviously surgery is not to be recommended. The surgical treatment has likewise been varied. Laparotomy with intra-abdominal manual breaking up of the faecal masses and milking them inside the colon toward the rectum has afforded temporary relief but so temporary that it cannot be recommended. Plication of the enlarged colon has been performed several times with no benefit.



Case 1.—R. S. Radiograph No. 1.

On the theory that tortion of the elongated sigmoid was the causative factor of this disease, fixation of the colon to prevent such tortion has been tried but the results of this operation do not warrant its further performance. Short circuiting operations, that is, anastomosis between the lower ileum or some portion of the colon above the affected part with the lower sigmoid or rectum without excision, have been tried but with results which warrant their being put nowhere but in the discard. The two operations which are worthy of consideration are colostomy and resection of the affected colon with anastomosis between the normal gut above and the lower sigmoid below. Colostomy may be performed for the purpose of drainage to save life during a period of extreme distention, or to allow of irrigation to keep the colon empty and theoretically to allow its contraction or as a preparatory procedure for partial colec-



Case 2.—E. M.

tomy with anastomosis. This latter operation is the operation of choice and the one which yields the best hope of success. There are one or two points in its technique which I have not found mentioned in the literature, but have learned from bitter experience. The ordinary intestinal clamps one might use for resection of intestine of normal thickness are valueless when applied to the lower segment as they do not have sufficient strength to hold the tremendously thickened intestinal wall. The largest size stomach crushing clamps of Payr are the only instruments I have found which will hold the wall from slipping at the point of amputation. Lateral anastomosis is the best, end to end not being feasible on account of the discrepancy in size between the upper and lower segment. After this has been completed a rectal tube should be introduced through the anus and up through the anastomosis. Failure to do this, I believe, caused the loss of one of my patients.

My own experience with this disease is limited to five patients which may be briefly summarized.

Case 1. R. S., boy, 2 months old, breast fed. Baby was constipated from birth and abdomen was noticed to be large. Four days prior to admission to the hospital the abdominal distention became much more marked, respiration became embarrassed and the child was referred to me with a diagnosis of *intussusception.*

Examination showed a moderately well nourished baby obviously uncomfortable but not suffering acute pain. The abdomen was tremendously distended but not tender and with the outline of large coils of bowel visible and palpable through the abdominal wall. Rectal examination revealed much feces without blood. A provisional diagnosis of megacolon was made. Enemata was given which brought back an unbelievable quantity of feces and the diagnosis confirmed by x-ray the following day. Three days later the abdomen was opened and a very large hypertrophied colon found, the affection beginning about two inches below the cecum and extending to the rectum (see radiograph No. 1, R. S.). Cecostomy was performed and a tube tied in, the abdominal wound being closed to the tube. Daily irrigations of salt solutions were given both through the colostomy opening and anus and the child improved rapidly, being sent home from the hospital on the eleventh day. The mother continued the treatment at home, but even with these daily irrigations some fecal retention resulted. This, however, she was able to largely overcome by massaging the abdomen at the time of irrigations. At the end of a year the baby was fairly well, weighed seventeen and one-half pounds, took his feedings well, etc., but was a tremendous burden to the mother, with the dressings, irrigations, massage, feedings, and what not. Believing I could better the situation, I performed a lateral anastomosis between the lower ileum and sigmoid. Unfortunately the child developed peritonitis three days later and died. This procedure was, I believe, partly an error in technique but largely bad judgment. It would have been far better to have postponed the second operation until the child was older.

Case 2. E. M., 7-year-old boy. Admitted March 27, 1919. Family history negative. Past History—Whooping cough when very small, measles two years ago, influenza one year ago. Present Illness—Has been constipated since birth. When child was a year old, mother thinks she heard something snap in the abdomen and his trouble she believed to have been worse since that date. Child is habitually constipated. Bowels move once in four days, occasionally intervals being up to a week or ten days. In the intervals between bowel movements, abdomen becomes swollen and he complains of cramps, these sometimes being severe enough for him to roll on the floor. Bowels do not move at all except as the result of medicine and enemata. Child is dull, lazy and never feels like playing or running.

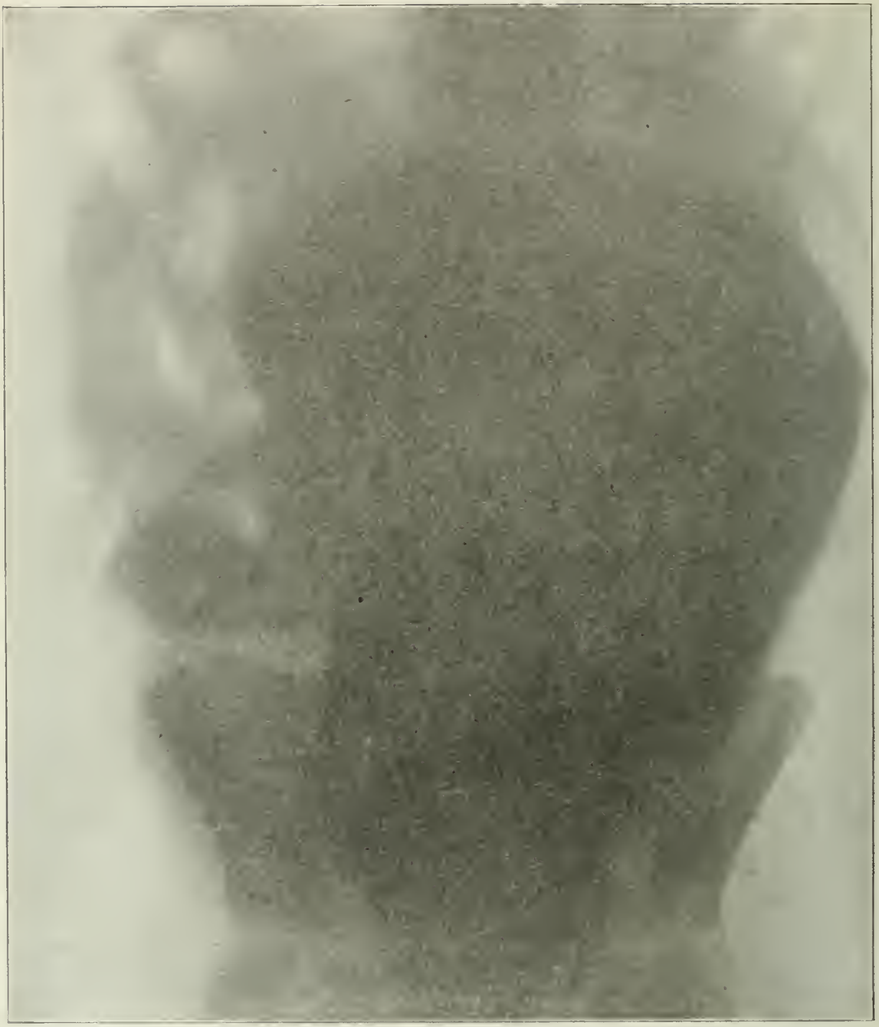
Physical Examination: Negative except for abdomen which is tremendously distended, most marked distention being in the left side, least distention in the right upper quadrant. Coils of intestine may be seen and felt through the abdominal wall. Rectal examination shows nothing but a very large spacious rectum filled with feces.

March 31, 1919. Operation. Median incision, dilated and hypertrophied colon found to extend from splenic flexure to rectum. Excision was performed starting above the hypertrophy and extending as low down as feasible to leave room for the anastomosis. Lateral anastomosis. Patient had an uninterrupted convalescence, was from the third to the eighth day given mild cathartic at night. Discharged home on the thirteenth day, requiring no cathartics. Seen January 30, 1920. Patient is now lively, active and alert, physically and mentally. Has had a cathartic only once since leaving the hospital and that was given because he had a cold. Bowels moved regularly daily and mother considers him an absolutely well boy. Physical examination shows no distention of the abdomen and no abnormality that I can find.

Case 3. A. W., girl, 6 years old. Story very similar to the last case. Operation August 20, 1919. Similar operation also performed with the exception that no tube was introduced in the rectum through the anastomosis. Child did very well for a week after the operation and then became distended which I believe was due to the fact that she had not had a tube and had acquired a large fecal impaction above the anastomosis which became strained and fatal peritonitis developed.

Case 4. D. M. Boy, 3 years old. Family history negative. Past history unimportant but for fact that child had developed slowly. Since he was a year old has had attacks of vomiting at irregular intervals, the attacks lasting about three days at a time, the intervals lately becoming more frequent, being every two or three weeks. At the time of these attacks the abdomen becomes very much distended and the vomiting continues until the distention is relieved by enemata. In the intervals the bowels are loose but they pass very small amounts at a time.

Examination not remarkable outside of the abdomen, which shows considerable distention with numerous large freely movable masses which are not tender. The largest masses extend from the right iliac fossa across at the

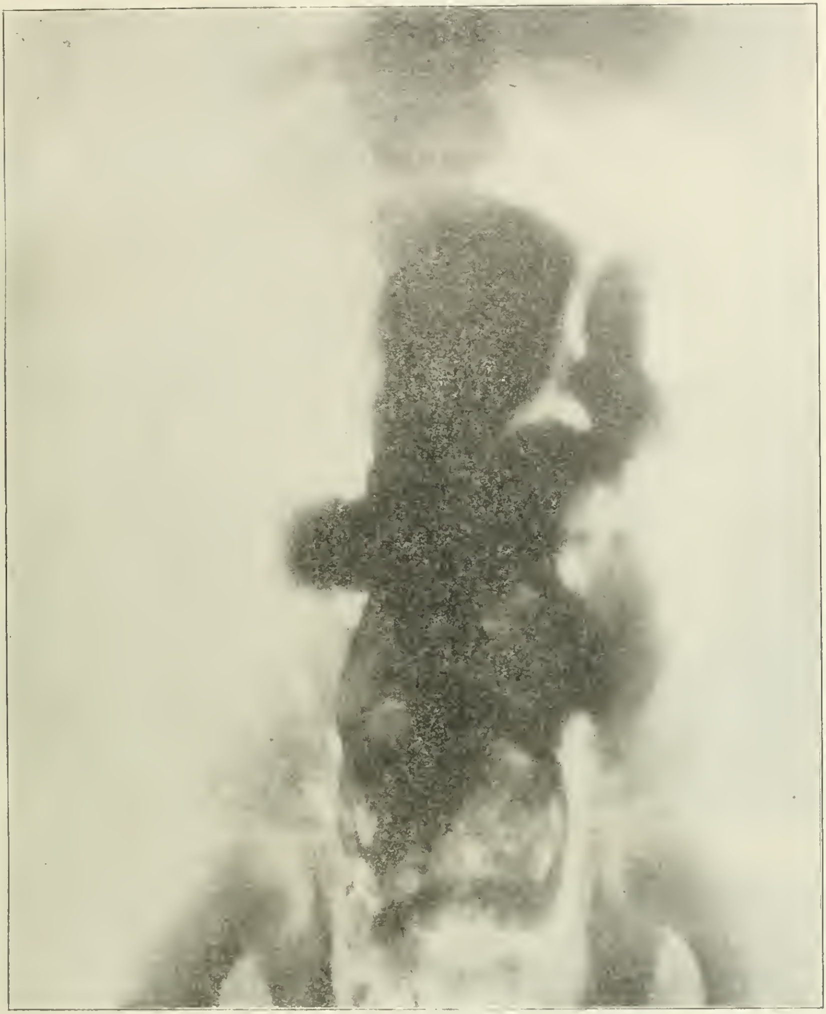


CASE 4.—D. M. Radiograph No. 2.

level of the umbilicus toward the left upper quadrant (see radiograph No. 2, D.M.).

Operation July 11, 1919. Median incision. Large growth and hypertrophy of rectum, sigmoid and descending colon extending almost to the splenic flexure were found. This was cut off as low down as possible and end sewed up with catgut and inverted with silk suture. The colon up to a point above the hypertrophy was then excised. Lateral anastomosis performed between proximal end of colon and rectum. Small piece of rubber drain inserted. Wound sewed up in layers; skin, with horse hair. This convalescence was interrupted by whooping cough and a fecal fistula as an indirect result; the latter, however, closed after a short time. He had a slow convalescence and required some catharsis for two or three months, but has had none for several months now and is apparently perfectly well.

CASE 5. E. W., boy, 9 years old. Bottle fed baby. Always more or less constipated but has been much more marked during the last three



Case 5. E. W.

years, during which time also the size of the abdomen has increased very markedly. He has been given strong purgatives two or three times a week during this time. Physical examination similar to Case 2.

Operation July 21, 1919. Descending colon and sigmoid excised, lateral anastomosis and tube introduced through the anus and anastomosis opening. Had an uneventful convalescence except that the abdominal wall remained loose and lax, the muscles not regaining their tone, and he required while in the hospital either Russian oil or a mild cathartic. Seen January 30, 1920. Bowels have moved every day since leaving hospital. Boy's general condition very much improved and the abdominal distention entirely disappeared though he still has considerable flare to the ribs.

From the literature, I have collected 113 cases which, with five of my own, makes a total of 118. Of these 60 were treated medically, with 41 deaths. Mortality, 67% ; 4 unimproved,

.06%; 8 improved, 13%; 7 cured, 12%. Surgically treated, 58, with 24 deaths. Mortality, 41%; 2 unimproved, .03%; 8 improved, 14%; 24 cured, 41%.

From these figures it would appear that the chance of curing a patient by the surgical treatment was over three times as good as by medical treatment. The chance of losing the patient is two-thirds less. The number of improved and unimproved is pretty similar with both lines of treatment. It may be said that the disease is not a very common one and that the average surgeon does not have the opportunity to perfect his technique as much as he might wish. The largest number of operated cases that I have found reported by any one man is seven, of which five recovered and two died. It is a striking fact that practically all deaths reported from surgeons are from peritonitis, there being only one or two from shock or other causes. This being so it would seem to me that with improved technique and better judgment, the future offers a much brighter outlook than the past and that even now one should unhesitatingly recommend surgical treatment for all the pronounced cases. For moderate cases in which the enlargement of the colon is not great it would seem that medical treatment should be at first tried and surgery resorted to when medicine had proved unsuccessful and before the patient is in extremis.

Bibliography.

Ward, L. E. Barrington: Brit. Jour. of Surg., 1914, p. 665.
Keene: Surgery, Vol. iv, p. 696.
Finney, J. M.: Surg., Gyn., and Obstet., 1908, p. 624.
NeulæBarger: Ann. of Surg., 1906, p. 785.
Richardson: Boston Medical and Surgical Journal, 1901, p. 155.
Hawkins: Brit. Med. Jour., 1907, Vol. i, p. 477.
Treves: Lancet, 1898, Vol. i, p. 276.
Griffith, J. P. Crozier: Ann. of Surg., 1918, p. 829.
Cadwaller, R.: Archives of Pediatrics, 1916, Vol. xxxiii, p. 665. 665.
Hamaner, C. A.: Cleveland Med. Jour.
Hirschspring: Jahrb. f. Kinderheilk, 1888, Vol. xxvii, p. 1.
Hirschspring: Festschrift f. Henock, 1890, p. 78.
Hirschspring: Grancher and Comby, Tome 2, Paris, 1904.
Hurd: Johns Hopkins Hosp. Bull., 1893, Vol. iv.
Wagner, C.: Surg., Gyn., and Obstet., 1910, Vol. x, p. 196.
Linde, J. I.: Arch. of Pediatrics, 1915, Vol. xxxii, p. 278.
Machel, H. T.: Trans. Am. Ped. Soc., 1913, Vol. xxv, p. 91.
Freidman, L. J.: Am. Jour. of Surgeons, Vol. xxvii, p. 291.
Skelding: Brit. Jour. Dis. of Child., Vol. iv, p. 526.

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# MEGACOLON IN THE ADULT WITH REPORT OF TWO CASES.

By Peer P. Johnson, M.D., F.A.C.S., Beverly, Mass.

Megacolon in adults is a sufficiently rare disease to warrant my putting on record two cases coming within my experience although I am unable to make any further contribution to the knowledge of the subject.

Hirschsprung in 1886 advanced the congenital theory for this disease and the consensus of opinion seems to favor its acceptance especially for those cases appearing in infancy or early childhood.

As regards the etiology in adults, however, there is a much greater variety of opinion. Cases with symptoms traceable to early childhood are generally accepted as a true megacolon or Hirschsprung's disease, but when such symptoms do not make their appearance until adult life the condition is often considered to be not of congenital origin but an acquired or pseudo-megacolon. However, it seems reasonable to believe that in these cases the pathological condition has been present from infancy but not marked enough to give disturbing symptoms.

In addition to the congenital theory many others have been brought forward. Among these may be mentioned, an abnormally long colon, long mesentery with secondary torsion, chronic colitis followed by hyperplasia, anal fissure with consequent spasm, valve formation below the involved area, and neuro-muscular defects in one segment. While such conditions may be present it is still a question whether they are the cause of the disease and they are certainly too infrequent to furnish a satisfactory explanation for the majority of cases. Nor have these various hypotheses been generally accepted while the congenital theory continues to gain in favor.

Megacolon is characterized not only by a great dilatation of the colon but by a marked hypertrophy as well. This hypertrophy and dilatation is much greater than we are ordinarily accustomed to see in partial obstruction of the bowel. However, the pathology of those cases known to be congenital differs in no important respect from that in cases assumed to be acquired. Therefore it seems futile to attempt to divide megacolon into the two groups, (1) true megacolon, (2) pseudo-megacolon. As a matter of fact it seems proper to consider the disease as a megacolon only when there is no demonstrable etiologic factor.

A part or all of the colon may be involved but the sigmoid is the most commonly affected and when this is the case the morbid process not infrequently includes the rectum. There is great dilatation with marked hypertrophy of the bowel wall; the mucosa and the muscular coats especially in the region of the circular fibers are principally involved. The blood vessels and lymphatics are greatly increased in size and the mesocolon is generally much longer than normal and considerably thickened. The sacculations having disappeared the affected portion is smooth, glistening in appearance and not infrequently resembles the wall of an ovarian cyst.

The symptoms are the result of intestinal toxemia due to fecal retention which at times may be enormous. The patient is generally poorly nourished, complexion muddy, tongue coated and breath foul. There is usually some anorexia and often nausea and vomiting. Constipation is the most striking feature. It is most obstinate and a month or more may elapse without movement of the bowels. The constipation may alternate with attacks of diarrhea. In some cases the constipation is extremely well borne and there is a remarkable absence of subjective symptoms. Pain is infrequent but may be occasioned by the necessarily vigorous attempts to move the bowels. The abdomen is generally greatly distended and large fecal masses may be present suggesting new growths. Case 1 was supposed by the attending physician to be an ovarian cyst and Case 2 was admitted to the hospital with a provisional diagnosis of abdominal tumor of hepatic or renal origin.

Finney states that, in differential diagnosis, tubercular peritonitis, chronic volvolus, annular carcinoma, dysenteric ulcerations and ovarian cyst must most frequently be considered.

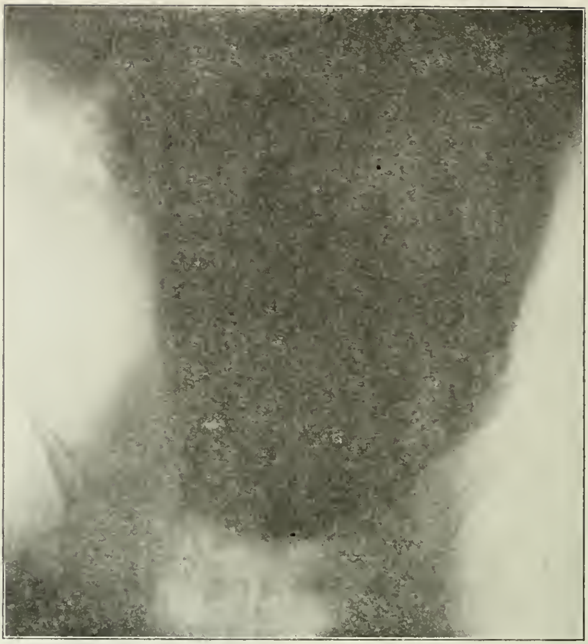
The history and physical examination will frequently suggest the diagnosis but by means of the barium enema and x-ray the question can be definitely settled. Barium by mouth is too small in amount and requires too long a period to be of value.

Little is to be expected from medicinal treatment. Various surgical procedures have been suggested, plication of the colon, colopexy, colocolostomy, colostomy, ileo-sigmoidostomy and colectomy. It is evident that the method of procedure will vary in accordance as to whether a portion or all of the colon is affected. Whether one will do a one-stage or a two-stage operation will also depend somewhat upon this circumstance and the personal preference of the operator. But whatever the preliminary procedure, the ultimate object should be the complete ablation of the affected part. In spite of the most strenuous endeavors to empty the bowel by catharsis and irrigation there may often remain large quantities of fecal matter. This may be in the form of fecoliths, which is not especially objectionable, or in a thick fluid mass. This latter condition may render difficult a primary resection and anastomosis. Under such conditions a two-stage operation becomes inevitable. Failure to recognize this fact in my first case made it impossible for me to complete the operation as I had intended, obliging me to do a colostomy. Where possible my preference is for a one-stage operation. When required by the condition of the patient or the bowel I should prefer a preliminary cecostomy and ileosigmoidostomy for involvement of the whole colon and a cecostomy alone for involvement of only one portion. Through the cecostomy copious irrigation could be depended upon to empty the retained fecal mass.

Case 1.—Sigmoid.

Case 1.—Sigmoid.

Case 1. Female, about 60 years of age. This patient was suffering from dementia praecox and had been for 20 years an inmate of the Danvers State Hospital. Any history bearing



Case 2. I.—Sigmoid. This mass occupies the right side.

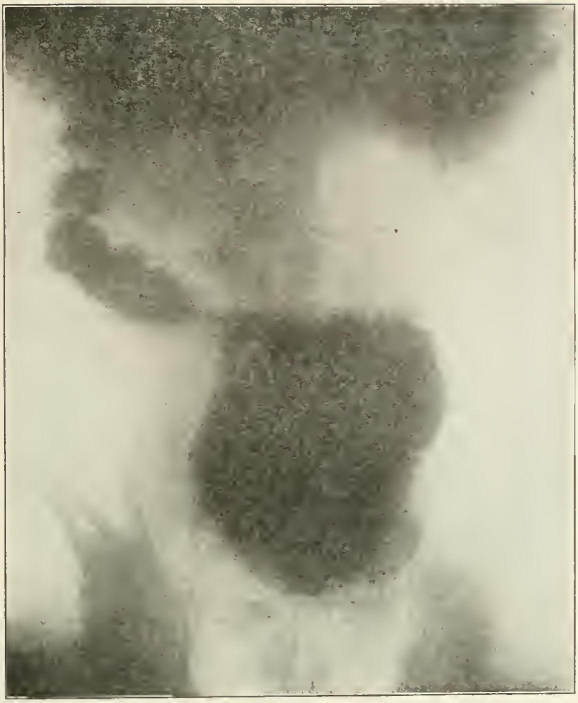
on the condition of the megacolon was not available but it was not believed that her bowels were constipated or that she had any symptoms especially referable to this condition. In March, 1917, it was noticed that her abdomen was enlarging rapidly. An ovarian cyst was diagnosed and early in June of that year I was asked to see her with a view to operation. At that time her general condition was fair. There was great distention of the abdomen, most marked from just above umbilicus downward. There was visible peristalsis. The percussion note was tympanitic throughout and there was no fluid wave or evidence of tumor mass. Examination by vagina and rectum was negative. The x-ray was not available and the possible diagnosis was considered: (1) megacolon, (2) chronic volvulus, (3) incomplete obstruction of the sigmoid due to carcinoma.

For the following ten days she was given a diet with a small residue and energetic attempts were made to empty the bowel by cathartics and enemata. She was operated upon on June 16, 1917. Operative findings were as follows: The sigmoid was elongated, enormously distended and hypertrophied, the mesosigmoid was abnormally long and the blood vessels greatly dilated. The morbid process began gradually at the termination of the descending colon and extended into the rectum. The remainder of the colon was moderately distended but thin and atonic and contained no feces. No mechanical obstruction could be found.

A sigmoidestomy was done with the intention of uniting the descending colon with the rectum, but the rectum and the greater part of the sigmoid was filled with thick fluid feces which could not be emptied out and the anastomosis had to be abandoned. The stump of the rectum was sutured over the clamp while the stump of the colon with the clamp attached was stitched into the upper angle of the wound. As there was some soiling from leakage, a tube was placed in the pelvis. The portion removed measured three feet in length and 20 inches in diameter and contained between three and four quarts of feces.

The patient stood the operation well and made an uneventful recovery. Aside from her mental condition she has been in good health since. At the present time the bowels move twice daily through the artificial anus. The stools are normal and well formed. Considering her age and mental condition, it has not seemed advisable to restore the continuity of the bowel.

Case 2. Male, 29 years of age. Admitted to the Beverly Hospital on January 29, 1920, with a provisional diagnosis of abdominal tu-



Case 2, II.—Post-operative x-ray showing the marked disproportion between the rectum and descending colon.

mor of hepatic or renal origin. On January 24th he had been seized with severe, colicky, abdominal pain most marked in the umbilical region. Castor oil had been taken, causing the evacuation of hard fecal masses but giving little relief to the pain. There was malaise and belching of gas but no vomiting.

The past history showed that the patient had been obstinately constipated from early childhood. A period of from ten to fifteen days was nothing unusual while at times thirty days would pass without a movement. During these periods there was but slight discomfort. The principal symptoms were: slight headache, coated tongue, foul breath, anorexia and distention. There was never vomiting or diarrhea. Enemata and large doses of castor oil (3 to 4 oz.) were the most successful methods of moving the bowels. The castor oil often had to be assisted by other drastic cathartics. During attempts to move the bowels there was severe abdominal pain sufficient to keep him from his work for from three to seven days. In childhood he had been treated in a Swedish hospital for acute intestinal obstruction and at that time seven quarts of cherry stones were said to have been removed from the bowels by the aid of laxatives and enemata.

The physical examination showed a fairly well developed and nourished man. Complexion was sallow, sclerae muddy, breath fetid, tongue coated, abdomen distended, rigid and tympanitic to left of midline. On the right there was dullness from the costal border to Poupart's ligament and on this side there was a large doughy, painless, freely movable, melon-shaped mass. It was believed that this mass was fecal and that it occupied the cecocolon. Examinations of blood and urine were negative; Wassermann negative; stools obtained by castor oil were dark brown in color, formed and except for the presence of small, inspissated masses were negative. Under free catharsis the tumor mass entirely disappeared. On February 2 a barium enema of 96 ounces was given, revealing an enormous opaque mass occupying the right side of the abdomen and extending, to beyond the midline and from the dome of the diaphragm to the brim of the pelvis. This mass was also thought to be in the ceco-colon. A barium meal was retained in the large bowel as late as five days but aside from stasis gave no other indication of trouble.

He was operated upon on February 17, 1920. The pre-operative diagnosis was congenital megacolon involving the cecocolon. Operative findings: On opening the belly a tremendously thickened and dilated bowel presented in the wound which was first thought to be the cecum; but on tracing it downward it was found to end in a dilated and thickened rectum and upward in the descending colon. The cecocolon had a long mesentery and lay in the epigastrium, resting upon the stomach. The appendix was on the liver and the gall bladder was greatly distended but otherwise normal. The sigmoid and rectum were alone involved in the disease. The blood vessels were enormously dilated and all the coats of the bowel were affected; there were no sacculations and the longitudinal fibres instead of being in the form of taeniae were uniformly spread out over the surface of the bowel, especially in the lower half. The mesosigmoid was long and thickened. The affected portion was 25 inches in length and had a circumference of over 20 inches in its most dilated portion. On opening, it was found to contain two quarts of liquid feces and two fecoliths, each the size of the fist.

Operative Procedure: Sigmoidectomy with end to end anastomosis between descending colon and rectum. As the open end of the rectum was fully nine inches across, the posterior four inches were closed and the union was made with three rows of chromic gut sutures. A small cigarette drain at the site of the anastomosis escaped through the lower angle of the wound while a rectal tube was passed through the anus to above the point of union for relief of distention by gas.

The patient made a remarkable convalescence and was decidedly comfortable. There was no abdominal distention and the wound healed by first intention. The bowels moved readily with three tablespoonfuls of liquid parafine daily. The color of his skin and sclerae became clear and he felt much improved in every way.

Proctoscopic examination on March 11 showed the suture line healed and great dilatation of the rectum. A barium enema at this time showed the great disproportion between the lumen of the rectum and the colon. The patient was discharged March 12, 1920. He reported on October 1, 1920, that he had been working steadily as a machinist since April. His bowels moved once or twice daily without the aid of catharties. He considers his health to be excellent and he is entirely free from all of his previous symptoms.

### BIBLIOGRAPHY.

Finney, J. M.: Congenital Idiopathic Dilatation of the Colon. Hirschprung's Disease. Surg., Gyn., and Obstet., 1908, Vol. vi, p. 624.
Terry, Wallace I.: The Surgical Treatment of Megacolon. Jour. A. M. A., Aug. 26, 1911, Vol. lvii, p. 731.
Judd, E. S.: Congenital Idiopathic Dilatation of the Colon: "Hirschprung's Disease." Collected Papers by the Staff of St. Mary's Hospital, Mayo Clinic, 1905-1909, p. 274.
Jackson, W. R.: Megacolon Megasigmoid. Hirschprung's Disease. Ann. Surg., 1917, Vol. lxvi, p. 441.
Blake, J. A.: Megacolon. Ann. Surg., 1912, Vol. lv, p. 455.
Hubbard, J. C.: Megacolon. Hirschprung's Disease—Report of Case in an Adult. Ann. Surg., 1916, Vol. lxiii, p. 349.
Van Hook, W., and Kanavel, A. B.: Congenital Idiopathic Dilatation of the Colon. Keen's Surgery, Vol. vi, p. 529.

### DISCUSSION.

DR. GILE, Hanover, N. H. When I was requested by the Secretary to open the discussion on these papers on diseases of the large intestine I felt much hesitation. My cause for such hesitation was due to the fact that I have recently heard so much about complete removal of the colon for all the ills of life, real and fancied, that I feared a series of papers along this line would be presented.

I was greatly relieved when the program arrived and I discovered that the papers dealt only with different pathological things concerning which there is some actual information from experience.

I shall confine my discussion to the papers dealing with megacolon. In the cases of megacolon in children I am not wholly convinced of a congenital pathology in the majority of these cases despite the evidence that has been presented. My own limited experience would point to the condition as secondary to some intermittent obstruction.

I have seen but two cases of this condition. One, a child of five with a content of three quarts in the large intestine between the lower end of the sigmoid and the spleenic flexure. In this case there was a ball of feces of firm putty-like consistency as large as an orange. The history showed the passage of only liquid stools and the fecal mass clearly acted perfectly like a ball valve.

The second case showed a fibrous adhesive band just at the lower end of the sigmoid, not producing a complete obstruction but without doubt frequently causing a sharp kink of the sigmoid over it and thus producing intermittent obstruction. Even without such adhesive band it would seem reasonable that at this point where the longer mesentery of the sigmoid suddenly changes to the short one of the rectum such sharp reflexion might often occur and great distention of the colon above might naturally take place. The pathology is parallel with that that causes the great distention of other pockets of the body. We do not, for instance, get a great hydronephrosis with a complete and permanent obstruction of the ureter, for with such obstruction the pressure in the urinary tubules soon comes to equal that in the circulation of the kidney and that organ ceases to function, but when the obstructive cause in the ureter is intermittent the pelvis of the kidney becomes slightly distended with the first attack, then the obstruction is relieved and the pelvis emptied. The next time it occurs the wall yields more readily as a result of the previous stretching and this time balloons larger; with many repetitions there finally occurs a large collection of fluid gradually pressing back into the tubules of the kidney.

The cases of greatly distended gall-bladder holding a pint or more of fluid seem to me to occur in the same way, resulting from a single round stone that intermittently obstructs the cystic duct. These conditions appear entirely parallel to that of the greatly distended colon and seem to be the simpler explanation. The variant microscopic findings in the bowel wall seems not incompatible with a change that results from the unusual pressure and might be explained in this way quite as well as by a congenital variation. In these cases occurring in adults similar explanation would appear reasonable and with added likelihood as atony of advancing years occurs. The simpler and more visible explanation always appeals to me more than the complex and obscure, hence perhaps my views as above indicated.

Dr. David Cheever, Boston: First, Mr. President, the readers should be congratulated on their extremely successful treatment of a disease at once so unusual and so difficult to handle. One of the questions I was going to ask, has been answered in part by Dr. Johnson, namely, what proportion of these cases of congenital origin grow to adult life? Cases of megacolon are not uncommon in childhood, and yet it is very difficult to ascertain from the literature what becomes of these cases or how many grow up.

There has been under my observation in the Brigham Hospital, a student about 24 years of age, who has had this condition since infancy; the history being that his bowels have never moved except by enemata. In his case, there is colonic stasis without actual toxemia, as he is extremely well-nourished, vigorous, has a clear complexion, and is apparently in the best of health. The x-ray shows an enormously distended colon. I was much interested about the view taken of his case at the Mayo Clinic, where he went for diagnosis and treatment, and where there appeared to be a considerable diversity of opinion; some members of the surgical staff advising operation and others taking a strongly contrary viewpoint. As a result, the patient felt inclined to postpone operative interference. This patient gets along very well most of the time, and, as I have said, shows none of the constitutional disturbances associated with constipation. His condition is described by one of my colleagues who saw him and said, "This patient simply carries his bed-pan with him." Every other day he flushes out his colon with about a gallon of water, which takes from a half an hour to an hour, and which makes him comfortable for about 48 hours. The difficulty is, of course, that on occasions he finds himself in a situation where this cannot be done, as, for instance, on long railroad journeys, and once in a while he has an attack of pain, abdominal distention, and vomiting, and suggestive signs of intestinal obstruction, all of which cause him much anxiety, but which have never yet been serious. His finger nails show changes suggestive of those associated with pulmonary osteo-arthropathy. Many of my colleagues have given it as their opinion that a case of that type will certainly not reach middle life; that is, he is likely to be carried off by pneumonia or some other intercurrent disease. I am much interested in Dr. Johnson's case as bearing on that particular point.

Dr. Alfred M. Rowley, Hartford: I want to thank Dr. Ladd and Dr. Johnson for their papers, and I want to ask Dr. Ladd whether he has noticed any increase in muscular hypertrophy at the recto-sigmoidal junction. I noticed that the dilatation practically ended at this point. There is a theory advanced that there may be either a spasm or hypertrophy of the fibres here, and I want to ask him if he has noticed any such hypertrophy or spasm.

Dr. D. F. Jones, Boston. There was a very extraordinary case at the Massachusetts General Hospital, and perhaps Dr. Richardson can give us the history of Mary King, who was operated on six or eight times for megacolon. She had a resection of the sigmoid at least twice, and each time an enormous colon was reformed. She turned up at the Massachusetts General Hospital about once in two years for a great many years, and when she did not go to the Massachusetts General Hospital, Dr. Maurice Richardson operated upon her in some other hospital. She became a morphine fiend, finally, and died.

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## Original Article.

# CONDITIONS IN PALESTINE DURING THE WAR AND MEDICAL RELIEF AMONG THE CIVIL POPULATION AND THE REFUGEES.*

By Izak Alcazár, M.D., Boston.

*(Concluded from page 71.)*

### NATURE OF TRACHOMA.

It may not be amiss to give a very brief description of this terrible eye disease from which a large percentage of the inhabitants of Palestine suffer.

Trachoma is largely prevalent in the Orient, and especially in Egypt and Palestine. It is called by the natives, "sore eyes," or "granulated lids." The disease manifests itself by an

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* On the 25th of May, Dr. Alcazár sailed for Palestine the second time to open an eye, ear, nose and throat hospital for the needs of the civil population. The plan is to establish the hospital in Haifa and hold clinics in the surrounding villages, one in Nazareth and one in Acca. The chief feature of the work will be to educate the natives as to the contagious nature of trachoma and in prophylactics.—*Editor.*

THE TRACHOMA CLINIC.

inflammation of the lining of the under surface of the eyelids called the conjunctiva, and involving also that part of the eye which is commonly known as "the white of the eye." The medical profession has not yet been able to discover the specific organism which is responsible for this dreadful malady. Therefore our present weapons in combating the scourge lie in three directions: first, by palliative medicines; second, by surgical methods which aim at correcting as far as possible the deformities and the faulty vision; and third, by educating the people in preventive measures.

### EARLY SYMPTOMS OF TRACHOMA.

Trachoma may begin without any alarming symptoms, and the victim may have the disease for years without being aware of his serious condition. But this is the exception. As a general rule, the trouble begins with a sensation as if there is dirt or sand in the eyes, which soon become red and painful. The lids swell, the discharge which at first is watery soon changes to pus and the lids become adherent in the morning. As the inflammation of the under surface of the lids progresses the conjunctiva becomes rough, somewhat like the appearance of a strawberry, and it feels like wet sandpaper. This acute attack may last weeks or months, when it subsides, but alas, only to recur many times. With each attack the lids become contracted and distorted, and the eyelashes which are normally turned forwards and upwards become turned downwards and backwards, thus constantly brushing upon the cornea, and causing the patient excruciating pain. We have all experienced the great discomfort which a small cinder or an eyelash causes in the eye. Imagine, then, the pain which victims of this disease experience with every wink of the eyelid, the under surface of which is covered with rough particles of flesh. This rough surface erodes the cornea, forms an ulcer, which in time either heals, leaving a permanent white scar, or it may perforate, with subsequent evacuation of the whole contents of the eyeball. In the first instance there remains a white, dense scar, where once a beautiful iris existed, and in the last instance we have an ugly shriveled stump instead of a beautiful live, movable eye.

If the inflammation of the eyeball is prolonged and very severe, all the coats of the eyeball participate in the process and become unevenly distended like a bunch of grapes. The eye protrudes beyond the eyelashes, thus giving the person a most hideous and ugly appearance. I have seen hundreds of such cases. Such a condition is bad enough for men, but it is dreadfully disfiguring to women. Many a beautiful girl has become positively repulsive. I used to spend a great deal of time urging such patients to have the eye enucleated and to have them use an artificial glass eye, which

A Group of Trachomatous Children.

would improve their looks a great deal. But, strange enough, the natives have a horrifying aversion to the removal of even such an eye.

Many operations have been devised to restore the distorted lids of such patients to the normal position, as near as possible, and it should be stated that it is the commonest operation performed in the East. The next operation in point of frequency is for the formation of an artificial pupil. The white scar which forms on the cornea and which covers the pupil, fortunately, does not always completely cover the entire cornea. A clear margin frequently remains around the circumference. An artificial pupil can often be made underneath the clear cornea by cutting away a portion of the colored part of the eye, known as the iris. The artificial pupil thus formed enables the patient to discern objects on the outer field of vision. An operation of this kind is a great blessing to such unfortunate patients. It makes it possible for them at least to get about without being led. The white scar has exactly the effect of a piece of ground glass placed before the eye, obscuring everything in the field of vision. The nerve of the sight, however, seldom becomes affected in this disease.

The result of such an operation is almost like a miracle. The patient sees immediately, the iris is cut off, and while still on the operating table. Many a patient showered blessings upon me the instant he beheld the light. Invariably it was more than I could do to prevent him from grabbing my hands in his attempt to kiss them.

### THE SCHOOL WORK.

If I were asked what was the greatest achievement of my service in Palestine, I would unhesitatingly answer, the school work.

I became convinced that in order to eradicate trachoma from Palestine the campaign should start with the schools. A child has enough diseases to fight against in its early years of life without being threatened with a malady that results in blindness.

With the assistance of the military authorities, school board and influential citizens, I launched the fight against trachoma in the schools at Jaffa and Jerusalem. The schools were divided into districts, each district to include five hundred children. A trained nurse was placed in charge of each district, which she visited daily and treated the eyes and ears of the pupils according to my instructions.

I made my visits to the schools from 7.30 in the morning until 10. Each nurse accompanied me to her own district. I examined every pupil and she wrote the diagnosis and treatment against the name. The classes were suspended during the time required for treatment. With my hospital, clinic, and operative work, it is evident that I could reëxamine the schools only once in about three months. The district nurses had worked in the clinic sufficiently long to understand the various remedies used so that I could rely on their own judgment. The acute cases and those progressing favorably were sent to my clinic for new instructions.

The cases which were a source of infection to the other pupils were strictly separated. This plan was vigorously enforced in the kindergartens where the little tots could not be expected to follow the rules of precaution which older pupils were instructed to observe. Furthermore, no new scholars could be ad-

A Group of Mastoid Patients.

mitted into any school under my charge without a certificate from me stating the exact condition of the eyes. During my service in Jaffa I had two thousand children under my supervision, and 24 schools in Jerusalem with an enrolment of over five thousand.

The results of this campaign soon became evident to the local authorities, parents, and to the pupils themselves, so much so that the children looked forward to the hour of their treatment. The teachers noticed that as a result of this campaign pupils lost fewer days and did better class work than was previously the case. I am confident that many a child in the Holy Land will go through life unhampered by faulty vision or deafness because of this school work which it was my privilege to institute. This is by far the most important work I have done in Palestine. How much greater the results would be if three or four physicians could devote their whole time to this urgent and worthy problem! The field is boundless.

### THE WORK OF THE EAR, NOSE AND THROAT.

So far I have devoted a great deal of space in describing the work of the eye department because two-thirds of my time was devoted to it. There was, however, a great deal of nose and throat work done.

Most of the nose and throat conditions were of the low grade chronic types. It was useless to attempt to cure such cases, because each patient required a great deal of individual attention, and in a clinic of the size I was conducting it was impossible to devote the time required. The only thing that could be done was to prescribe cleansing drugs and soothing sprays. More time was devoted to the correcting of intranasal deformities.

A large number of tonsil and adenoid operations were performed at Jaffa and at the Jerusalem hospitals. There was time only for the very urgent cases. The chronic and the very large tonsils were considered subjects for operation.

Mastoid and Trachoma Patients.

The ear conditions presented peculiar complications. I found among the patients a large number of chronic suppurating ears. The modern methods of treating acute ear infections are unknown in Palestine. Previous to the war there were in Palestine two German ear specialists. Only the very rich could apply for treatment, and the poor were neglected; consequently, a great many of these patients presented a middle ear with foul discharge and most of its hearing power destroyed. The ordinary treatment for most of these patients proved ineffective so that it was found necessary to perform the serious operation of a radical mastoid in order to rid them of the discharge and save them from the possibility of brain complications, such as meningitis or brain abscess.

Mastoid and Starvation.

During the months of November and December of 1918 and the January and February of 1919 there was in Palestine a terrific epidemic of influenza with a complication of meningitis and mastoid infection. Many of these patients had an involvement of both ears. I was the only otologist for the whole of Southern Palestine, containing a population of about three hundred thousand inhabitants. I was therefore ordered to undertake the ear, nose and throat in Jerusalem in addition to my clinic and hospital work at Jaffa. I left Jaffa for Jerusalem by automobile every Thursday afternoon. The following morning I examined and treated this class of patients and operated in the afternoon. On Saturdays I acted as consultant to the American Red Cross in Jerusalem, as they had no otologist on their staff. Between my regular work and that of the Red Cross, I spent two very busy days in Jerusalem. It was necessary to leave my cases to the care of the local physicians and return to Jaffa on Sunday morning to resume my hospital and clinic duties.

I kept up this work between Jaffa and Jerusalem for six weeks, but found it very taxing to my strength. The number of acute mastoids in Jerusalem became too numerous and so complicated that it was thought advisable that I should be transferred to Jerusalem and take charge of the entire department of the eye, ear, nose and throat. Here I remained stationed until I left Palestine on July 30, 1919.

The work at Jaffa was too urgent and too imporant to be neglected altogether. A young physician who had had some experience in diseases of the eye, was placed in charge of my clinic and I made weekly trips to Jaffa to perform the urgent operations of that enormous field which today could keep busy at least five specialists in this line of work. Needless to say that a limited number of operations could be done in one day. The very serious cases were sent to my hospital in Jerusalem.

## CONCLUSION.

This narrative briefly depicts the sufferings of a people who have lived four long years with war, starvation and disease staring them in the face. Countless died; many were left to drag out a miserable existence. It was to these people that I was called to give a helping hand in the hour of their distress. I did it gladly; but the work is still in urgent need of continuation. Now is the time to hasten relief to those people who are still suffering from the shock of war and from the acute ophthalmic conditions which are leading them inevitably to partial or complete blindness.

The way to answer this great and urgent need is to establish in a large city a central hospital. Connected with it there should be a traveling clinic conducted in a large tent and moving about from village to village, thus reaching a large portion of the population. In this manner cases requiring serious operations could be referred to the central hospital. Medical aid could thus be brought to the huts and tents of the natives, especially to the peasants in the villages, and to the wandering Bedouin in the deserts. Palestine will never rid itself of this dreadful trachoma if the schools and those who dwell far away from the cities are neglected. Furthermore, it is a crime to encourage emigration to Palestine until the new colonists could be offered a land reasonably free from trachoma. It must never be lost sight of that the majority of the children who are born in the land have trachoma.

When the last day of my labor among the inhabitants arrived, I laid down my instruments with sincere regret, but also with a cherished hope that some time in the near future I might answer the call for a more constructive and lasting benefit to a land of sacred tradition and to a long suffering people.

"If I forget thee, O Jerusalem, let my right hand forget her cunning."

## Medical Progress

## RECENT PROGRESS IN SURGERY.

BY EDWARD H. RISLEY, M.D., WATERVILLE, MAINE.

THE two surgical conditions to which writers have devoted the most concentrated attention during the last quarter are goitre and empyema. The July 17th number of the *Journal of the American Medical Association* prints four articles dealing with the purely surgical aspects of the disease. T. J. Nason discusses mistakes in one hundred thyroidectomies and states that the ideal time for operation is within the first six months. The closer we get to the high wave of toxicity, the higher is the mortality and the larger the number of incomplete cures. The patient who is operated on before the first crisis is eventually much better off than the one who is carried to and then through the crises by medical treatment, and operated on later. The author describes in detail his technic of fractional cauterization of the gland in bad cases, which has proved beneficial as a preliminary to or in place of ligation.

F. A. Lahey devotes his discussion largely to the diagnosis and management of intrathoracic goitres. J. R. Eastman believes that local anesthesia is the ideal anesthesia for partial or complete thyroidectomy and describes his technic. His article is graphically illustrated.

Willard Boullet describes his so-called emergency technic in thyroid cases. A long linear incision is made along the inner border of the sterno-mastoid muscle and the gland reached on its lateral aspect mainly by muscle retraction. He claims a more bloodless and less traumatizing operation and less liberation of toxic material. For details of technic the reader is referred to this article. For the skilled surgeon it would seem to be a valuable procedure but probably not one to be tried by the occasional thyroid operator.

The August number of the *Annals of Surgery* also presents a symposium on thyroid diseases. Porter, M. F., presents a clinical study of one hundred and thirty-nine cases and makes the observation that thyroid disease may be an important factor in the causation of female sterility.

Mayo, C. H., calls attention to the fact, as shown by the first million draft recruits, that we have in the United States definite goitre regions, the condition being most common in the northwest and second in the Great Lakes region. He discusses the differential diagnosis of exopthalmic goitre and adenoma of the thyroid with hyperthyroidism, two often compared but clinically different conditions. He refers to Plummer's exhaustive study in 1915 in which it was shown that enlargement of the thyroid was noted from five to ten years earlier in the adenoma cases than in the exopthalmic cases and that hypertension was practically always present in the former but rarely in the latter.

Crile, G. H., also discusses briefly toxic adenoma in relation to exophthalmic goitre.

Judd, E. S. discusses at length the results of operation for adenoma with hyperthyroidism and exopthalmic goitre. He speaks of a third group in which the nervous manifestations are prominent and the differential diagnosis often difficult but in which the basal metabolism is normal, and in these cases medical rather than surgical treatment is indicated. He emphasizes the great importance of the basal metabolism studies in all goitre cases.

The best article of this whole symposium is that on the management of toxic goitre from the surgical point of view by C. H. Frazier, who also emphasizes the importance of basic metabolism studies in all cases of thyroid derangement. Because the degeneration changes that take place in the vital organs during the period of procrastination under medical treatment of early cases are permanent and preclude the ultimate and complete recovery of the patient he takes a firm stand for early operation. Early ligation serves a definite purpose in one way in that it is a very good index of the degree of reaction that may be anticipated after the final thyroidectomy.

Freeman, L., describes his tourniquet operation in toxic cases.

The July number of the *Annals of Surgery* furnishes a group of four articles on empyema. Ashhurst, G. P. C., displays some very interesting diagrams and half-tone plates. He is a firm believer in preliminary aspiration of a chest suspected of being empyematous. Thoracotomy should be postponed until the fluid is frankly purulent, as this delay will permit the formation of former adhesions and prevent the collapse of the lung when the cavity is opened. The operation should preferably be done under local anesthesia.

The remaining three articles discuss the etiology of clinical empyema with the various procedures to be used in different types of empyema. Lilienthal's tabulation of conditions and operative indications is a valuable contribution to the subject.

Lovett and Wolbach have contributed a valuable piece of clinical and pathological work to the subject of obscure bone lesions. The important fact to be drawn from this work is that tuberculosis in bone may simulate any other infectious process in location and character of the lesion. Diagnosis from x-ray studies alone is, therefore, occasionally impossible and recourse must be had to clinical evidence, and, when possible, to pathological examination.

Rubin presents in detail his technic for the non-operative determination of the patency of the Fallopian tubes by means of intrauterine inflation with oxygen and the production of an artificial pneumoperitoneum. He outlines indications and contradictions. The procedure is radical but of undoubted value in the hands of an expert.

Sachs and Belcher present a preliminary report on the intravenous injection of a saturated salt solution to reduce cortical odema in operations on the brain. This is especially valuable when there is a tense dura which it is necessary to open for the sake of exploration. The salt solution reduces volume and hence tension and the danger of hernia of the brain subsequent to operation is much lessened. This has been proven experimentally and clinically and the technic seems of decided value.

Adron presents a valuable contribution to the literature on brain abscess. He finds four principal etiologic factors in the formation of abscess of the brain. These are otitic infection, frontal sinusitis, injury to the skull and hematogenous infection. The abscess is usually single except when it is of hematogenous origin associated with a general pyema and then it is frequently multiple. A brain abscess in its course may pass through the initiatory, the quiescent and the terminal stages. The different phases can be determined more definitely from the history and duration of the complaint than from the physical findings. Surgical treatment is of little value in the initiatory or terminal stages, or in the presence of meningitis, but is of great benefit during the quiescent stage. If there is doubt as to the differential diagnosis of brain tumor and brain abscess in the quiescent stage it is advisable to explore rather than to perform a decompression for intracranial pressure or to wait for terminal symptoms.

Again, in the *Annals of Surgery* for September, we have an excellent symposium on empyema by Tuffier of Paris, Hedblom of the Mayo Clinic, Lincoln Davis and J. A. Hartwell, and articles on the treatment of bronchial fistulae, perforating war wounds of the chest and thoraco-abdominal injuries. This is a valuable number. It should be read as a single chapter on lung surgery to be properly digested and appreciated.

* * *

Murphy Memorial Oration.—Sir Berkeley Moynihan delivered the first Murphy Memorial Oration of the American College of Surgeons during a meeting of the College in Montreal on October 11. The oration was founded in honor of the late Dr. J. B. Murphy of Chicago. Sir Berkeley Moynihan also presented to the College a mace, the gift of the surgical consultants of the British Army during the war.

Research Station at Pensacola.—In order to carry on research work on bubonic plague, a research station has been established at Pensacola by the United States Public Health Service. Additional equipment will be provided to facilitate the investigations which will be conducted by trained experts.

Montefiore Home and Hospital.—A bequest of three hundred thousand dollars to the Montefiore Home and Hospital for Chronic Diseases is included in the will of the late Jacob Schiff.

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## THE JUNE MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

The year 1920, hallowed by the anniversary of the landing of the Pilgrims, ought to be a memorable year in the history of medicine in New England. It seems right and fitting that this, the great Association which maintains the best traditions of medicine in our great country, should visit New England on the anniversary of the landing of the Pilgrims on our coast.

Invited by the Massachusetts Medical Society, the Association has honored the City of Boston by accepting the invitation to make our city its meeting place at the next meeting in June. It is sixteen years since Boston entertained the Association before. Those of us who were present will remember the value to Boston of the scientific work that was done, the friendships which were formed, the general benefit which the profession of New England received from the entertainment of the vast, eager, enthusiastic throng of the profession of our great country which attended the meeting. We may, perhaps, be allowed to say that the Association enjoyed the meeting, which both from the character of the scientific work and from the entertainment provided, was a memorable one.

On this year, the year of our great historical anniversary, they are coming again. We hope that this year, as in 1906, the profession will unite in giving them a most hearty and cordial welcome. The opportunity is a great one, and if embraced in the same spirit, ought to result in a meeting only more successful than that in 1906. All that is needed, and we feel sure that it will be forthcoming, is the enthusiastic cooperation of the profession of New England with the committee in charge to make it memorable. The men want to come here, they remember the last occasion with pleasure, and it is up to us to make of this one a success. Let us take hold and do so.

Finally let all physicians who are not members of our great national association join at once, and participate in the pleasures and advantages of the meeting, and all who are now members aid the administration by registering early, on Monday and Tuesday, the sixth and seventh of June. The great flood of arrivals from a distance will come late Tuesday afternoon and early Wednesday morning, so that if those who live in this vicinity will register at Mechanics Building on Monday they will, with little trouble to themselves, help the committee in avoiding trouble and confusion.

There will be a program of clinics at the various hospitals on Monday and Tuesday which we hope will make it worth everyone's while to come on the first day. On these two first days will be concentrated all the clinical work, as it is the policy of the Association, and a wise policy it is, to schedule no clinics which might interfere with the scientific work of the sections. So it will be to the advantage of all who possibly can, to come on Sunday and register early Monday morning, the first day. On account of the large expected attendance, the presentation of a registration card will be necessary for admission to the clinics.

Again, let us take hold and help the great medical institutions of Boston, these schools, hospitals and laboratories of which we are justly proud, to make an adequate and memorable impression on our members from all over the land, and gain from them, on the other hand, inspiration and encouragement to better work for humanity.

## MEDICAL NOTES.

Weighing and Measuring of Children.—To establish a standard table of the heights and weights of children, a conference of representatives of the U. S. Children's Bureau, the U. S. Bureau of Education, the U. S. Public Health Service, and of various educational and private organizations working for the betterment of children, has just been held in New York City, according to a statement issued December 20, 1920, by the Children's Bureau of the U. S. Department of Labor.

At the present time, various tables of measurements are in use by the different organizations engaged in weighing and measuring children. The results of the tests are not comparable; also considerable confusion has arisen because of apparent differences in the standards of normal development as given out by the various organizations. The conference brought out the fact that the various tables are in substantial agreement as to the fact, the differences being chiefly matters of presentation.

A complete standard table will be prepared by a committee, and all future weighing and measuring of children can then be in accordance with this uniform table. The findings of the tests will be comparable and much greater use can be made of the facts revealed.

The conference was attended by the following: Dr. Bird T. Baldwin, Iowa State University; Dr. Taliaferro Clark, U. S. Public Health Service; Dr. William R. P. Emerson, Nutritional Clinic for Delicate Children; Dr. L. Emmett Holt, Child Health Organization; Mr. Ira V. Hiscock; Mr. Frank A. Manny, Nutritional Clinic for Delicate Children; Dr. Anna L. Rude, U. S. Children's Bureau; Mr. Edgar Sydenstricker, U. S. Public Health Service; Prof. Edward L. Thorndike, Columbia University; Mrs. Ira Couch Wood, Elizabeth McCormick Memorial Fund; Dr. Thomas D. Wood, Columbia University; Dr. Robert M. Woodbury, U. S. Children's Bureau.

A Research Information Bureau.—The National Research Council has established a Research Information Service as a general clearing-house and informational bureau for scientific and industrial research. This "Service," on request, supplies information concerning research problems, progress, laboratories, equipment, methods, publications, personnel, funds, etc. Ordinarily inquiries are answered without charge. When this is impossible because of unusual difficulty in securing information, the inquirer is notified and supplied with an estimate of cost.

Much of the information assembled by this bureau is published promptly in the "Bulletin," or the "Reprint and Circular Series" of the National Research Council, but the purpose is to maintain complete up-to-date files in the general office of the Council.

Requests for information should be addressed, Research Information Service, National Research Council, 1701 Massachusetts Avenue, Washington, D. C.

Brooklyn Cardiological Society.—The first meeting of the Brooklyn Cardiological Society was held at the office of the president, Dr. William J. Cruikshank, 102 Fort Greene Place, Brooklyn, N. Y., on Monday evening, November 29, 1920. It is believed that this is the first Cardiological Society ever formed in New York or in any other state in the Union. Dr. Cruikshank delivered the opening address, and other speeches were made by the Hon. Andrew MacLean, the Rev. Dr. Emil Kraeling, Ph.D., Phil.D., and Mr. Henry Allan Price.

The following physicians were elected as officers and honorary members of the Society:

William J. Cruikshank, M.D., F.A.C.P., president; Glentworth R. Butler, M.D., F.A.C.P., vice-president; William W. Laing, M.D., 195 Greene avenue, Brooklyn, N. Y., secretary; Frank Bethel Cross, M.D., F.A.C.P., 832 President street, Brooklyn, N. Y., treasurer. Honorary members: Thomas Lewis, London, Eng.; Richard C. Cabot, Boston, Mass.; Sir James Mackenzie, London, England; John Cowan, Glasgow, Scotland; Robert Hurtin Halsey, New York; William Thomas Ritchie, Edinburgh, Scotland; W. S. Thayer, Baltimore, Md.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending January 15, 1921, the number of deaths reported was 198 against 213 last year, with a rate of 13.63 against 13.75 last year. There were 26 deaths under one year of age against 34 last year.

The number of cases of principal reportable diseases were: Diphtheria, 96; scarlet fever, 55; measles, 58; whooping cough, 10; tuberculosis, 41.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 5; measles, 1; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 4; whooping cough, 1; tuberculosis, 18.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 2.

Massachusetts Society for Mental Hygiene.—At the luncheon of the Massachusetts Society for Mental Hygiene at the Copley-Plaza, December 10, 1920, there were about 114 present. The speakers were: Dr. Thomas W. Salmon, Medical Director of The National Committee for Mental Hygiene, New York, and Dr. A. W. Stearns, Medical Director of The Massachusetts Society for Mental Hygiene. Their subjects were: "Practical Tasks in Mental Hygiene," and "The Call for Mental Hygiene Activity in Massachusetts," respectively.

Dr. Walter E. Fernald, vice-president, presided in the absence of the president. At the annual meeting of the society, the following persons were elected as directors for a period of five years: Hon. Frederick P. Cabot, Dr. C. Macfie Campbell, Dr. Walter Channing, Prof. F. Stuart Chapin, Mrs. W. Murray Crane, Dr. Herbert J. Hall, Dr. John A. Houston, Prof. George E. Johnson, Frederic H. Knight, Ph.D., Bishop William Lawrence, Dr. Abraham Myerson and Mrs. George T. Rice. To fill vacancies in the group the term of which expires in 1923, the following were elected: Mrs. T. Russell Sullivan, G. R. Agassiz and John B. Tivnan.

Following the meeting of the Society, there was held the annual meeting of the directors. The following officers and executive committee were elected: President, Dr. C. Macfie Campbell, in place of Prof. William H. Burnham, resigned; vice-president, Dr. Walter B. Fernald; treasurer, Charles E. Ware, Esq.; executive committee: Miss Edith N. Burleigh, Hon. Frederick P. Cabot, Dr. Donald Gregg, Dr. Abraham Myerson, Herbert C. Parsons, Mrs. George T. Rice, Dr. Charles E. Thompson.

Since 1913, this Society has conducted an extensive educational campaign by means of its lecture bureau, the distribution of selected literature, and by conferences. As the general field of mental hygiene is highly developed in Massachusetts, the Society will devote itself in future chiefly to the following specialized fields:

1. The improvement of medical standards through better teaching in the schools and through medical societies.

2. Increased emphasis in the field of education by introducing courses on mental hygiene into colleges, normal schools, and other special schools, both public and private.

3. The prevention of mental disease through earlier diagnosis and treatment, by means of establishing clinics in courts, state and general hospitals.

4. The extension of special classes now provided for by law, but spreading slowly.

5. The application of hygienic principles of pedagogy through mental clinics in public and private schools.

6. A more scientific and humane, as well as more effective, attitude toward delinquency, through recognition of individual traits.

7. The application of knowledge of personality and temperament, as well as the prevention of disease, in the industries.

8. The diffusion of correct and sensible views concerning mental health, through popular education and publicity.

Somerville Medical Society.—At the annual dinner of the Somerville Medical Society, held recently in Boston, Dr. M. W. White was elected president, Dr. George Mahoney, vice-president, and Dr. Edmund H. Robbins, secretary and treasurer. The report of the secretary showed that the membership of the Society has increased during the past year and now includes almost every physician in Somerville. Dr. White, the president of the Society, was graduated from Boston College in 1894, and from Harvard Medical School in 1898. He was house physician at Carney Hospital during the Spanish-American War, and during the World War he was the medical member of the draft board of Division 1, Somerville. Dr. White has practised in Somerville for twenty-one years and is a member of the Somerville Hospital Staff.

At its meeting, the Somerville Medical Society was addressed by Dr. John Bottomley of Boston, who spoke on "Surgical Reminiscences," and by Mrs. Charles E. Mongan of Somerville, and Dr. Harvey Towle and Dr.

Paul White of Boston. Dr. Charles E. Mongan was delegated to represent the Society at all maternity aid hearings.

New England Ophthalmological Society.—A meeting of the New England Ophthalmological Society was held at the Massachusetts Charitable Eye and Ear Infirmary in Boston on the evening of December 21, 1920. The program included discussion of hospital cases by Dr. W. D. Rowland, and the following papers: "Methods of Dealing with the Capsule in Cataract Extractions," by Dr. Arnold Knapp; "Results of Cataract Extraction in Capsule," by Dr. Allen Greenwood; and "Intracapsular Cataract Extraction," by Dr. F. H. Verhoeff.

Tuberculosis Consultation Service in Massachusetts.—The Massachusetts State Department of Health has been making experiments in a number of communities to determine the value of consultation service in the prevention and cure of tuberculosis. Consultation clinics have been established in 16 places, including Worcester, Gardner, Fitchburg, Clinton, Lowell, Lawrence, Haverhill, Woburn, Taunton, Brockton, Fall River, Plymouth, Pittsfield, Springfield, Holyoke and Adams. The method has been for the superintendent or some designated member of the medical staff of one of the State tuberculosis sanatoria to attend the clinics at no cost to the patient or to the city, the consultant in such cases being an expert in the diagnosis of tuberculosis. In each of the places where the trial has been made, the consultations have been held in the local dispensary on a designated Wednesday of each month, so that the medical staff officer from the nearest sanatorium could take care of four such consultations each month. The experiment seems to have been attended with considerable success, inasmuch as these consultations have been well patronized and both the local physicians and the patients appear to have been glad of the opportunity to secure expert advice. If in the opinion of the Health Department the results of this work warrant continuing this service, consultation clinics may be established in many other communities.

War Relief Fund.—The French Orphanage Fund has received contributions to a total amount of $631,305.25.

Public Lectures at the Harvard Medical School.—A series of free public lectures on medical subjects to be given on Sunday afternoons this winter, have been announced by the Harvard faculty of medicine. The speakers will be physicians connected with the Harvard Medical School, and the lectures have been carefully arranged so as to cover subjects in which there is a wide public interest.

The lectures will be given at the Medical School, Longwood avenue, Boston, on Sundays, from January 2 to March 27. Each lecture will begin at 4 p. m. No tickets will be required, but in view of the popularity of these lectures in past years and of the fact that the doors will be closed at five minutes past the hour, those who wish to obtain seats are urged to arrive punctually. The full schedule of lectures is as follows:

Jan. 2—Dr. R. W. Lovett, "Infantile Paralysis."

Jan. 9—Dr. Alfred P. Rogers, "The Correction of Dental and Facial Mal-Development to Children." (With lantern demonstration.)

Jan. 16—Dr. Frederick T. Lord, "Pneumonia: Its Cause, Prevention and Treatment."

Jan. 23—Dr. Franklin S. Newell, "The Hygiene of Pregnancy." (To women only.)

Jan. 30—Dr. Harris P. Mosher, "Catarrh: Its Prevention and Treatment."

Feb. 6—Dr. John Lovett Morse, "A Talk to Parents about Their Children."

Feb. 13—Dr. Reid Hunt, "Wood Alcohol Poisoning and 'Substitutes.'"

Feb. 20—Dr. E. W. Taylor, "The History and Significance of the Mental Hygiene Movement."

Feb. 27—Dr. Charles J. White, "Care of the Skin."

Mar. 6—Dr. Lesley H. Spooner, "A Health Clinic: Its Purposes and Accomplishments."

Mar. 13—Dr. Freeman Allen, "Modern Methods in the Administration of Anesthetics."

Mar. 20—Dr. Paul Thorndike, "The Responsibility of the General Public in the Control of Venereal Diseases."

Mar. 27—Dr. Alexander Quackenboss, "Care of the Eyes."

Public Bequests.—By the will of the late Mr. Joseph M. Herman, the sum of $10,000 is left in trust to Henry Solomon, to be used by him for the purpose of medical research and expended in connection with or through any existing hospital, medical school, or institution of learning, or by establishing a private laboratory.

The will of the late Miss Katherine E. Bullard included a bequest of $2,500 each to the Massachusetts General Hospital for a free bed, and to the Perkins Institution for the Blind. Upon the death of the last beneficiary, Harvard University will receive a sum to be used for the advancement of research in neurology.

The Peter Bent Brigham Hospital receives a bequest of $2500 by the will of the late Mr. John P. Reynolds of Boston.

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## Obituary.

### HOWARD EDWIN SETTLE, M.D.

Dr. Howard Edwin Settle, of Boston, died at the Parker Hill Hospital on December 20, 1921, at the age of 29 years. His death was caused by appendicitis. Dr. Settle was born at Berne, Albany County, New York, the only child of Theodore and Kate Settle of Berne, N. Y. He received his medical degree from Harvard Medical School in 1916, and then served at the Peter Bent Brigham Hospital and the Boston City Hospital. Dr. Settle specialized in diseases of the eye, ear, nose and throat. During the war, he served as aural surgeon in the Navy from July, 1917, to April, 1919, and was stationed at New London, Conn., Newport News, Va., and Washington, D. C. He was retained by the Government as assistant surgeon in the Public Health Service, to examine men in the Army and Navy, and was transferred to Parker Hill Hospital for operation work on December 11, 1920. On January 1, 1920, he was appointed assistant to the ophthalmic surgeons of the Boston City Hospital. Dr. Settle was a member of the Massachusetts Medical Society and a Fellow of the American Medical Association. He is survived by his widow, who was Miss Frances Barber of Montepelier, Vt., and one child.

## Miscellany.

### THE DARDANELLES EXPEDITION.

In a recent issue of *The British Medical Journal* has been published the following account of the medical arrangements of the Dardanelles expedition:

The medical arrangements were under the control of Surgeon-General Birrell from March 15th, 1915, to the later part of August, when he was succeeded by Surgeon-General Bedford. Surgeon-General Sir William Babtie was appointed Principal Director of Medical Services in the Mediterranean in May, 1915, and exercised general supervision over all the medical arrangements for the Mediterranean Expeditionary Force. Surgeon-General Birrell reached Alexandria on April 1st, 1915, but did not arrive at Mudros until April 18th, his representative in the interval being Lieut.-Colonel Keble. It is to the credit of Colonel Keble that he refused to accept an estimate of 3,000 casualties made by the general staff, and drew up a scheme of evacuation, subsequently endorsed by Surgeon-General Birrell, based upon an estimate of 10,000 casualties. The scheme provided for the accommodation of 1,995 serious cases on regular hospital ships, or, at a pinch, 2,409 cases, and for 7,300 not seriously wounded, or a grand total of 9,709. It appears that though at the time of the landing there was accommodation for the estimated number of serious cases in the hospital ships, the transports also allotted for the reception of wounded were not provided with the necessary appliances. The Commission is of opinion that in the actual circumstances of the landing the supply of hospital ships was insufficient, but the instructions given to Sir Ian Hamilton by the Secretary of State for War did not contemplate a landing, and therefore Surgeon-General Birrell had no opportunity of adapting his requirements to what actually happened. The Commission, however, thinks that if the administrative staff had accompanied General Head Quarters to Mudros the D. M. S. would have been in a better position to inform himself of the probable operations and to estimate the consequent requirements. Even when the intention to make a landing became known to him, however, he shared the assumption of the general staff that a considerable advance would be made, and that it would therefore be possible to collect and treat the wounded on shore. This expectation was not fulfilled.

Unfortunately the number of hospital ships, and even of hospital carriers, was very insufficient, and, owing partly to the difficulty of sorting cases, a large number of serious cases were taken to the transports (black ships), which were only equipped for light cases. The condition of the transports appears to have been extremely bad for about a month after April 25th; many were very dirty and some were carrying horses. As it was impossible to land them the horses and the wounded travelled to Alexandria on the same ship. There was also great deficiency in the medical staff, and this seems to have continued, for it would appear that on June 29th the *Saturnia,* filled with wounded, had no medical officer until she was boarded on their own initiative by several. This story is denied, but the denial is not accepted by Sir Thomas Mackenzie. Here, as in many other parts, the report is difficult to follow. The general conclusions of the Commission are summarized in the following paragraphs:

23. The provisions for the evacuation of the wounded, especially in the matter of hospital ships, proved insufficient to meet the emergencies which actually arose. We think that, if the operations to be undertaken in landing on the peninsula had been considered before the expedition started and a general plan prepared, further provision of hospital ships might, and probably would, have been made.

24. We do not think that the Director of Medical Services, Surgeon-General Birrell, before leaving England had any opportunity of estimating the number of hospital ships required, as he did not know what operations were contemplated.

25. We think that the separation of the Administrative Staff, including the Deputy Adjutant-General and Director of Medical Services, from the rest of the Head Quarters Staff during the time immediately preceding the landing was a mistake, and that it would have been better if the Director of Medical Services had been kept more fully informed of the operations which were proposed. The time was very short in which to make preparations, and we doubt if it was then possible to obtain a sufficient number of hospital ships to accommodate the casualties which actually occurred. If Surgeon-General Birrell had been able to discuss matters with the General Staff he might have seen the necessity of, and been able to obtain, a fuller supply of appliances and equipment for the transports.

We think, however, that it would have been well if while in Egypt, where he was arranging for hospital accommodation on a large scale, he had made requisition for appliances such as would probably be required for even the less serious cases on the transports, such as bedpans, blankets, pillows, and clothing. We recognize, however, that at that time he was separated from General Head Quarters, and therefore not possessed of adequate information as to the intended operations.

26. The scheme of evacuation drawn up by the Director of Medical Services was based on an estimate of casualties which was approximately correct, and would probably have worked satisfactorily if the anticipation of a rapid advance after the landing had been fulfilled. The failure of the scheme was mainly due to the fact that no substantial advance was effected, and that no hospitals could therefore be established on the land. This necessitated the immediate evacuation by sea of all casualties without any possibilitiy of separating the serious cases from those of a slighter nature. The transports or black ships were therefore used for cases for which they were not intended, and for which they were not adequately staffed or equipped.

In these circumstances the greater part of the sufferings of the wounded in the first days after the landing seem to us to have been inevitable, but there appears to have been some want of organization in the control of the boats and barges carrying wounded to the hospital ships and transports, which occasioned delay in their embarkation.

27. For the dislocation of the arrangements for evacuation, owing to the non-fulfilment of the expectations of the military authorities, the Director of Medical Services cannot be held responsible. He could not do otherwise than be guided by the views entertained by the Commander-in-Chief, and conveyed to the latter's subordinates in the operation orders and instructions for the landings issued by General Head Quarters. It may, indeed, be contended that a prudent administrator, even though assured by superior military authority of the probability of success, would do well not to leave out of account the possibility of failure, but to be prepared alike for either contingency demands a flexibility of organization and an adaptability of resources which in war are seldom attainable.

28. After the first two or three weeks, until the heavy fighting in August, there was an improvement in the condition of the transports, though some of them continued to be unsatisfactory. The transports required close supervision, which was, however, much hampered by the want of means of communication between the several ships and the ships and shore.

29. The scheme for the evacuation of the wounded in the August operations was based upon an approximately correct estimate of casualties, and the supply of hospital ships was much larger than at the first landing. On the whole, this scheme worked well, though again there were cases in which the transports were not satisfactory, and the organizations for transferring the wounded to the ships was imperfect.

30. After the middle of May the evacuation was made more difficult by the presence of enemy submarines. The transports were then unable to come to the beaches, the wounded being conveyed to them on trawlers and minesweepers, some of which were not suitable for their accommodation.

31. The field ambulances and clearing stations were, on the whole, efficient, considering the great difficulties under which the work in them had to be done.

32. The executive work of the medical officers and staff of the Royal Army Medical Corps and the Dominion Forces, and of the physicians and surgeons who placed their services at the disposal of the War Office, was performed with great energy, courage, and skill under very trying conditions.

33. The supply of medicines and other medical requisites was, on the whole, adequate, though at times there was a shortage of some drugs at some places. The food also was on the whole satisfactory, but at times it was not possible to give the sick and wounded all the variety of food which was desired, and at times the supply of water was insufficient.

34. The difficulties under which the evacuation of the wounded was carried out, especially in the early part of the operations, were exceptional and not easily surmountable. We think that in some cases there was a want of organization and supervision. The Director of Medical Services, Surgeon-General Birrell, did his best; we are of opinion, however, that he was not equal to the task of grappling with the exceptional conditions which arose.

35. Great help was given by the naval surgeons on the transports as well as on the trawlers and sweepers, and they were always ready to do everything in their power. It was not, however, possible to employ them on the transports during their voyage to Alexandria or Malta, as they could not leave their ships for an indefinite time. The naval officers concerned in the evacuation of the wounded gave every assistance and rendered excellent service.

Sir Thomas Mackenzie, who signs the report, publishes also a supplementary report. Dealing with medical matters, he says that the arrangements for the transport of the wounded were in a very unsatisfactory state until August, 1915. He expresses the opinion that the medical side of the campaign had never been thought out. Treatment of the wounded on the Gallipoli peninsula was, he says, as satisfactory as circumstances permitted, but many of the complaints as to the transport of men to the ships and overseas were justifiable. Though the medical authorities were informed that the military authorities expected the Turks to be driven back, so that room could be made for establishing hospitals ashore, provision ought also to have been made for the contingency of failure. Hospital ships were insufficient; troopships had to be converted into carriers and ambulance vessels, and were insufficiently staffed. The medical personnel did their utmost, but some of the wounded men had to shift for themselves. On some of the black ships the wounded were exposed to the sun and heat, without food or drink, for sixty or seventy hours. There was a shortage of equipment and supplies, and the sanitary arrangements on the converted trawlers were lamentably deficient.

## Correspondence.

### MATERNITY AID.

Everett, Mass., Jan. 4, 1921.

*Mr. Editor:—*

The correction in the JOURNAL of December 30, 1920, referring to the statement of the writer of the editorial on Maternity Aid of August 5, 1920, which stated that "the women of Massachusetts stand about eight times as much chance of death from childbirth, if cared for by their own physicians or midwives, as do the women in the poorer parts of Boston under the care of careful but inexperienced students properly supervised by experts," amends this statement by saying, "that eight deaths should be added to the list of out-patients who died as a result of pregnancy and labor during a fifteen year period, making a mortality rate of 14, instead of 11, per 10,000 live births, as compared with a rate for the state of 38 in 1901 and of 84 in 1918." In the issue of August 26, Dr. Bateman questioned the fairness of comparing the 11 deaths per 10,000 live births, with the excessive death rate of 84, which was apparently influenced very largely by influenza. There is reason to suppose that the death rate was also increased in 1919 by the same cause. In the same issue Dr. Mongan pointed out that the maternal death rates in many parts of the state were not wholly hopeless, while Dr. Malone, in the issue of September 2, 1920, suggested that the robustness of some of the types of patients treated at the out-patient department of the hospital might help toward a favorable death rate. The recent correction made, whereby an addition of eight deaths improves the chances of the women of the state by 25%, leads the writer to question whether another revision might not discover more deaths which would improve the chances of life some 25% or 50% more. Lest the laity outside of Boston should entice the inexperienced students away because of their marked efficiency to the detriment of the medical schools and for the peace of mind of the prospective mothers living at a distance, and since most of your readers have neither the time nor the opportunity to see the printed reports of the Lying-In Hospital for the years 1901 to 1915, inclusive, the writer suggests that you publish the record of the hospital for the out-patient department as shown in the body of the reports, in three or five year periods, for the 15 years under consideration, giving the number of deaths and the cause of death, and whether they died at home, at the Lying-In Hospital, or at some other institution.

The writer's interpretation of the record shows 225 or more patients who needed more care than the inexperienced students could give them, who were cared for elsewhere, and that there were about 30 deaths. This would practically double the death rate as first stated. It would require some explanation to convince the writer that deaths from this group due to septicaemia, eclampsia, post-partum shock and post-partum hemorrhage should not be legitimately a part of the record if it is to be used as a measure of comparison with the whole state. If the writer is correct, the average death rate for the state for the period 1901 to 1915 was 47 per 10,000 live births. If this is used instead of the higher rate for 1918 of 84, in comparison with the doubled student rate of nearly 22, the students would appear to be some over twice as efficient. This seems to the writer the fairest comparison, in view of the fact that, following 1915, conditions were much modified by the war and influenza.

The printed reports of the Lying-In Hospital, published for 1917, 1918, and 1919, condensed the summary of the hospital work into a space of two pages for each year, so that the data for these years are not at present easily obtainable by most physicians. If there is to be a full report of the hospital for the past three years printed soon, might not the comparison with the year 1918 be left until more is generally known, as we hope it will be, after the entire report and investigations of the Maternity Commission are printed in full? In view of the fact that the correction of December 30, 1920, is not signed, it seems fair to assume that if the editor of the Journal was not the writer of the different articles under consideration, at least he is in agreement with the implied position, that the inexperienced students are still six times as efficient, when properly supervised by experts. The Journal record so far has indicated no attempt to modify the measure of efficiency by introducing any of the factors that must always enter into the chances of life and death when comparing individuals or groups. The editorial writer chose the death record alone as the measure of comparison. The hospital record seems to show that for the fifteen year period at the Lying-In Hospital proper, the average death rate was 215 per 10,000 live births. Comparing this with the 14 per 10,000 live births of the students, the inexperienced students seem to be 15 times as efficient as the experts. The students being six times as efficient as the general practitioners and midwives, it logically follows that the general practitioners are two and one-half times as efficient as the experts.

The record of septicaemia is also worth considering. The out-patients are credited with five deaths from septicaemia for the entire fifteen year period, when 29,204 patients were cared for, or one death to 5,841 patients, or 1.71 to 10,000 live births. The hospital department, with 10,790 patients, had a record of 56 deaths from septicaemia, or 52 to 10,000 live births. Here the inexperienced students seem to be about 30 times as efficient in preventing septicaemia as the experts, and the practitioners of the whole state nearly five times as efficient as the experts. The hospital record for the five year period 1901 to 1905, shows 3172 patients and seven deaths from septicaemia, or one death to 453 patients. For the period 1906 to 1910, 4,095 patients with 21 septicaemia deaths, one death to 195 patients. For the period 1911 to 1915, 4,219 patients and 28 deaths from septicaemia or one death to 150.7 patients.

The writer has only one report of the Massachusetts Homeopathic Hospital at hand, that of 1915. The record shows that at the Maternity Department there were 1,117 live births, with 16 deaths of mothers. Of these, two died of septicaemia. The record at the Lying-In Hospital the same year was 850 live births, 16 deaths, seven being from septicaemia. The record seems to indicate that the Homeopathic Hospital was more efficient by 31%, but the writer is sure than any medical man of experience would admit the comparison was not a fair one after studying the cases cared for; but no such element has so far appeared to modify the dictum of August 5, 1920.

The writer entertains the hope that enough has been said to show that even such serious subjects as vital statistics need to be used, as Jeff would say, with "discression," and that however innocent the intent, statistics may work an injustice. The writer is not a statistician and, while an effort has been made to be mathematically accurate, he would not care to be condemned utterly if some slight errors might be found if looked for diligently. The experience gained by a summer course at the Boston Lying-In Hospital out-patient department in the early nineties, while an inexperienced student, as well as observation in hospital and private practice since, leads the writer to agree with Dr. Malone that many patients of foreign birth have a physical stamina that makes motherhood a much easier task and that they are often less susceptible to septic infection than many women of native stock. The number of deaths given in the state report for 1918 from puerperal fever for several of the larger mill cities, with a large proportion of foreign mothers, seems to suggest the same conclusion.

There is certainly evidence that maternal mortality has increased very markedly since the beginning of the war and the advent of the influenza in 1918. It certainly is the duty of every medical man to help investigate at least so much of the record as comes within his own field of observation or work. On general principles, it does not seem reasonable to assume that the general practitioners of the state have suddenly bcome only half as efficient as formerly within the past few years. The record of the Boston Lying-In Hospital showed an increase of 300% in the deaths from septicaemia for the period 1911 to 1915 as compared with the period 1901 to 1905. We do not recall that there was any warning editorial in the Journal, or that there was any public demand that the institution should be managed by the State Board of Health.

The writer does not wish to be understood as trying to discredit in any way the excellent record of the Lying-In Hospital in all its departments, nor to attribute any unfair intentions on the part of the editorial writer of the Journal. But he does think that the editorials referred to are a good illustration of much of the propaganda that has been used in recent years to advance legislative health measures. The data often submitted and later quoted contain considerable fiction and the application is often unfair. The "correction" article states that the error referred to was made through misinformation, which was published August 5 and September 9, 1920, and it was accepted in good faith by most of us until December 30, 1920.

The world today is overcharged with misinformation and undoubtedly misinformation of some kind contributed toward the death of many of the 804 maternal deaths in Massachusetts in 1918.

Geo. E. Whitehill, M.D.

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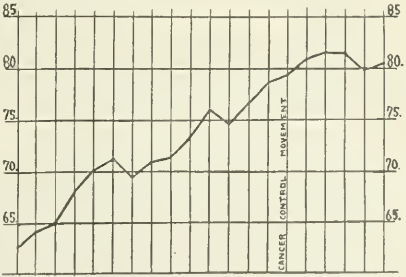
## THE INTERPRETATION OF CANCER STATISTICS

*Mr. Editor:—*

If the figures of the cancer death rate, as quoted by Dr. Little in the December 23 issue of the Journal, are represented graphically, it will be seen that the curve from 1914 to 1919 is of a distinctly different character from the curve for the preceding years, or for any other six year period thereof.



Again, if we average the cancer death rates for three year periods from 1902 to 1919, we find still less cause for discouragement.

| | |
|---|---|
| 1902–1904, inclusive | 67.87 |
| 1905–1907, inclusive | 70.47 |
| 1908–1910, inclusive | 73.83 |
| 1911–1913, inclusive | 76.73 |
| 1914–1916, inclusive | 80.29 |
| 1917–1919, inclusive | 80.24 |

Three hundred and sixty-five days is, after all, an arbitrary unit of time, and in a disease the duration of which is usually much longer than a year, a period of one thousand and ninety five days is at least as good an indication of the direction in which the tide is running.

From both of these viewpoints we see a change in the cancer death rates as reported, beginning about 1914. Oddly enough, cancer control work was started on a relatively large scale at about this time. The cancer control enthusiast should not be permitted to claim, *post hoc propter hoc*, that his propaganda is beginning to bear fruit, for he has not yet covered the territory from which the statistics have been gathered. He may be very much encouraged to continue his work, however.

Another explanation of the change since 1914 is that we are reaching a point of diminishing returns in our ability to diagnose cancer—which is also most encouraging.

Dr. Little says, after discussing these figures: "Because the truth is not evident, is no excuse at all for holding to and advocating a proven untruth." I do not claim that the results of the surgical treatment of cancer and precancerous conditions demonstrate a "proven truth," but I do claim that they do not demonstrate a "proven untruth" and that at least they are certainly not discouraging.

In one of his last articles, speaking of pneumonia and cancer, Sir William Osler said: " . . . we need a stern, iconoclastic spirit which leads, not to nihilism, but to scepticism—not the passive scepticism born of dispair, but the active scepticism born of a knowledge that recognizes its limitations and knows full well that only in this attitude of mind can true progress be made."

I am respectfully yours,
Dwight O'Hara.

751 Main Street, Waltham, Mass.

## "A MEER DULL PHYSICIAN."

31 Massachusetts Avenue, Boston,
December 30, 1920.

*Mr. Editor:—*

The following essay is from "Microcosmography, or a Piece of the World Discovered, in Essays and Characters," by John Earle, D.D., of Christ Church and Merton Colleges, Oxford, and Bishop of Salisbury, London, 1628.

The essays are among the first character studies in the English language. In other essays, depicting the alderman, the lawyer and the shopman, the author uses the same trenchant pen, which fact may mitigate our grief in reading of the light esteem in which the early seventeenth century physician was held.

### A Meer Dull Physician.

"His practice is some business at bedsides, and his speculation an urinal; he is distinguished from an empiric, by a round velvet cap and doctors gown, yet no man takes degrees more superfluously, for he is doctor howsoever. He is sworn to Galen and Hippocrates, as university men to their statutes, though they never saw them, and his discourse is all aphorisms, though his reading be only Alexis of Piedmont or the Regiment of Health. The best cure he has done, is upon his own purse, which from a lean sickliness he hath made lusty, and in flesh. His learning consists much in reckoning up the hard names of diseases, and in the superscriptions of gally-pots in his apothecary's shop, which are ranked in his shelves and the doctor's memory. He is, indeed, only languaged in diseases, and speaks Greek many times, when he knows not. If he have been but a bystander to some desperate recovery, he is slandered with it, though he be guiltless, and this breeds his reputation, and that his practice, for his skill is merely opinion.

"Of all the odors he likes best the smell of urine, and holds Vespasion's[*] rule, that no gain is unsavory. If you send this once to him, you must resolve to be sick however, for he will never leave examining your water, until he has shaked it into a disease; then follows a writ to his drugger in a strange tongue, which he understands, though he cannot conster.

"If he see you himself, his presence is the worst visitation: for if he cannot heal your sickness, he will be sure to help it. He translates his apothecary's shop into your chamber, and the very windows and benches must take physic. He tells you your malady in Greek, though it be but a cold, or headache, which by good endeavor and diligence he may bring to some moment indeed.

"His most unfaithful act is, that he leaves men gasping, and his pretence is, death and he have a quarrel and must not meet, but his fear is, least the carkass should bleed. Anatomies and other spectacles of mortality, have hardened him, and he is no more struck with a funeral than a grave maker. Noblemen use him for a director of their stomach, and ladies for wantonness, especially if he be a proper mann. If he is single, he is in league with his she apothecary, and because it is the physician, the husband is patient. If he have leisure to be idle, (that is to study), he has a smatch at alcumy and is sick of the philosophers stone, a disease uncurable but by an abundant phlebotomy of the purse. His two main opposites are a mountebank and a good woman, and he never shews his learning so much as in an invective against them and their boxes. In conclusion, he is a sucking consumption, and a very brother to the worms, for they are both ingendered out of man's corruption."

Dr. Earle has a similar essay on the surgeon, to whom he pays his respects in a no less flattering manner.

Very truly yours,
William Pearce Coues, M.D.

[*] The Roman emperor Vespasian ordered a tax on urine.

## SOCIETY NOTICES.

**Harvard Medical Society.**—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, February 1, at 8.15 o'clock.

PROGRAM.

1. Mechanism and Uses of Hypertonic Salt Solution in Conditions of Increased Intercranial Tension.
Drs. Frederick E. B. Foley and Percival Bailey.
2. Tetany Following Forced Respirations.
Dr. Samuel B. Grant.

Medical students and physicians are cordially invited to attend.

Cyrus C. Sturgis, *Secretary.*

**Boston City Hospital.**—Cheever Amphitheatre, Staff Clinical Meeting, Friday, Feb. 4, 1921, 8.15 p.m.

Topic: X-Ray Collation.

1. X-Ray Interpretations of Diseases of the Lungs. Dr. S. Ellsworth.
2. Interpretations of Radiographic X-Ray Examinations. Dr. G. W. Holmes.
3. X-Ray Application in G.-U. Examinations. Dr. L. B. Morrison.
4. The Upper Right Quadrant. Dr. A. W. George.
5. The Lower Right Quadrant. Dr. P. Butler.
6. X-Ray Therapeusts. Dr. H. Osgood.

Each speaker will have 15 minutes for the presentation of his views. Open discussion. Physicians and medical students invited.

Dr. Halsey B. Loder,
Dr. H. Archibald Nissen,
*Committee.*

The Boston Medical and Surgical Journal

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## Address

### MEDICAL JOURNALS AND THE CAMPAIGN AGAINST CANCER.*

By Frank J. Osborne, New York City,

*Executive Secretary, The American Society for the Control of Cancer.*

Rather a large order and one which should be neither adulterated nor shortweighted, the campaign against cancer is all that the name implies. It has been, and for years to come will be a battle, a fight against gross ignorance and traditional fear and hopelessness on the part of the lay public and no small skirmish against a degree of lethargy existing even in the medical profession. However, we have been told that battles are lost in the same spirit in which they are won by real fighters and we must therefore maintain a hopeful and aggressive spirit in our efforts to overcome this, one of the most difficult of all medical problems, if we hope to make any eventual headway against it. It is true that our present day methods of treatment hold out very little hope in advanced or late cases of cancer; but it is equally true, that recognition of early symptoms and immediate competent treatment justifies a most sanguine attitude and really gives hope of ultimate successful treatment of the majority of cancerous and precancerous conditions. This is the message which the American Society for the Control of Cancer has attempted to propagate during the six years it has been in existence, and those who have been in a position to observe and who have kept careful records of progress claim that results are now beginning to manifest themselves; some stating that as high as 80% of successful cures could be obtained in certain areas, if the patients would but present themselves for treatment early.

Having its birth, as this Society did, within the medical profession in response to a resolution adopted by the American Gynecological Society and endorsed by the Congress of American Physicians and Surgeons in 1913 it has enjoyed the closest coöperation from the organized medical fraternity and its official journals. From the very first it was recognized that the medical publications of the country constituted one of the most powerful agents for the dissemination of cancer control information to the profession and it is a pleasure to be able to say that this coöperation has continued and advanced during the past years. Hardly a month goes by that some cancer paper or editorial does not appear in these journals, and it is worthy of note that even though the paper itself may make no mention of the national campaign being waged against this disease, the discussion which follows almost invariably brings it out and stresses the point that eventual success lies in impressing upon the public the necessity of prompt and intelligent action, and upon the profession the necessity of equipping itself to render effective service in the way of diagnosis and treatment when the patient presents himself for advice. The latest evidence of coöperation between your journals and this Society was the way in which you made known to your readers the existence of the new handbook prepared especially for the medical profession setting forth the latest and most approved methods of handling this disease. The announcement which went forth in your columns resulted in innumerable requests for this booklet and has been a source of encouragement to the Society and a full recompense for the time and energy devoted to its preparation.

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* Read before the fifty-first annual meeting of the American Medical Editors' Association, at New Orleans, April 27, 1920.

I should now like to be a little more explicit and attempt to indicate, with your indulgence, certain ways in which medical journals can greatly increase this valuable coöperation and be even more useful as a medium of suggestion and education to the medical profession and through it to the general public. The policy of the Society has been to have State Medical Societies appoint permanent cancer committees. During this six-year period twenty-one such societies have done so. Many of these committees, however, flourished for only a short time after their formation and have now with a few notable exceptions either become inactive or have ceased to exist. In urging the appointment of these committees the Society has always stressed *permanency in office* because of the fact that cancer is a disease which is constantly present in the population and one against which only continued efforts of education can make any impress. It is therefore felt that such committees should be composed of a few carefully selected men upon whom should be placed the duty of organizing and carrying out a thoroughgoing and persistent system of attack which could not be so well done if the personnel of these committees was constantly changing. Having gone this far, however, the Society is, by the very nature of the case, compelled to stop. These special cancer committees appointed, in most cases, merely at the suggestion of the Society, are not of it, and not subject to outside dictation or even suggestion. But it is self-evident that the editors of medical journals are in a position to greatly assist both this Society and these committees. The readers of these journals always read with interest and due respect suggestions coming from the editorial desk. Such recommendations as might be editorially offered, would certainly receive far more consideration coming officially, than if they came from an organization such as the Cancer Society, which at best would be non-official. Medical editors by taking an active interest in the organization of such cancer committees, could largely shape the make-up of such bodies. It would be simple to show why such committees should be permanent as to tenure and composed of men carefully selected for their prominence, interest, energy and sanity. The appointment of such cancer committees is a matter of no small moment, and if the efforts of the members are to result in anything worth while in the cancer control campaign, they should be most judiciously chosen. The whole success of such a movement often depends upon the character of the appointees on such committees.

Having shown your subscribers the way to organize such committess may I invite you to go one step further? It is a well known fact and one which simple observation in almost any direction will verify, that many committees, even though well chosen and organized, drop off into a state of coma or actually die of inanition. As a rule such committeemen, to be really useful, are busy men. They cannot be expected to devote a great deal of their valuable time to work even of this highly humanitarian nature. Medical editors might well consider themselves in the nature of executive secretaries. One of their normal functions is to stick pins into slumberers and to make first suggestions. It is often easier for any committee or organization to work a plan than to plan work. By virtue of his office the medical editor is in the best possible strategic position to sustain interest and get action. He is in the vanguard of the medical movement. He is in possession of all tried and proved methods of the public health and preventive medicine campaign. It is not new for him to outline programs of activities and with the added facility of presenting such programs in an appealing and forceful manner results would be bound to follow. In this way he would take the burden of this fundamental work off the shoulders of the committee which would result not only in conserving their time and energy but in giving them the latest available information as to how to prosecute this particular educational campaign. It is realized that some committees are so blessed with specialized talent or led by a chairman so well equipped with organizing and campaigning ability that such service from medical editors would not be required. On the other hand it has been our experience that no matter how efficient and successful a committee may be, there will come a time when its activities will lag and its effectiveness begin to wane unless stimulated from some outside but closely coöperating and helpful agency.

While not assuming to have perfected any such program of activities for use by medical editors, it might not be amiss at this time to suggest a few of the more obvious lines of attack in order to block out roughly the scope of work with which such a committee might properly interest itself. Its first attention should, of course, be directed to the official medical organizations in its state and in view of the fact that education of the profession should go hand in hand with that of the public, we would place equal emphasis upon both phases of the subject. In order to indicate how this may be attained, I would call attention to two activities recently carried out by cancer committees of state medical societies. In Massachusetts, by coöperating with the State Department of Health, the Medical Society secured the distribution of the new handbook for the profession entitled, "What We Know About Cancer." This is a most fundamental piece of professional education. The booklet is brief, readable, authoritative and suggestive. To have placed it in the hands of each medical man in this State is a distinct service and one which is most heartily appreciated by the Cancer Control Society, and will no doubt go far in our educational campaign. As a parallel to this educational work in the profession, the cancer committee of the Ohio State Medical Association conducted a "cancer week" throughout that state. As a preliminary to this campaign a series of meetings was held among county medical societies and academies of medicine on the subject of cancer. The state was then divided into eleven districts, each with a supervisor to manage the details of the campaign. A large number of qualified medical men were appointed as lecturers to address lay audiences and two hundred and fifty of the lecture-outline prepared by the National Society were provided in order that these lecturers might present the subject in a uniform manner. The "week" was started with a "cancer Sunday" on which the subject was briefly presented from the pulpits in the various churches, and during the ensuing seven days, the speakers addressed groups of women's clubs, welfare organizations, chambers of commerce, rotary clubs and others. These are concrete instances indicating how well such cancer committees can function when properly guided. The chairmen of these two committees are to be congratulated for their efficiency, and it is hoped that they will continue the work so well begun. Another useful suggestion would be, that each local medical organization, whether a county society or academy of medicine, be urged to devote at least one meeting each year for its own members to a discussion of cancer and hold at least one public meeting on the same subject annually.

Somewhat removed from the medical organization group but still intimately connected with it, are hospitals and dispensaries; and nursing organizations and training schools. Posters and placards on cancer should be prepared for bulletin board display in these institutions and every effort should be made through medical staffs or hospital superintendents to include cancer control in the lecture course for pupil nurses. All such schools should be supplied with special literature prepared for nurses; and nurses' associations both state and local, should be encouraged to provide speakers on the subject at their various meetings. Red Cross and all public health nurses as well as industrial nurses should be supplied with the same information through lectures and pamphlets.

Another suggestion which medical editors might bring to the attention of chairmen of cancer committees, is to interest the members in bringing the latest supplementary cancer control information to students in medical schools and colleges. Special stress should be laid upon giving due attention to instruction of students in the recognition of precancerous conditions. Our present day knowledge indicates that the best hope of preventing cancer is to inform the public of the predisposing danger signals and to educate the profession to recognize them as such. If it be true that our best hope of controlling this disease lies in acquainting the younger generation with these facts, it is equally true that complete success implies that no medical man should enter upon the practice of his profession without a thorough knowledge of all diagnostic procedures.

Three other agencies whose major interest is strictly professional are public health associations, health centers, and industrial physicians and surgeons. All these groups are doing most valuable preventive medicine work. Each is brought in intimate contact with numberless people who require instruction and no cancer committee can do a thorough job of professional education on the subject of cancer without enlisting the coöperation of these groups.

After having completed this part of the program which has to do specially with work through professional or quasi-professional bodies (or rather while keeping step with this part of the program as was done in Ohio), the committee should include in its activities further educational work with groups of lay or non-professional organizations. A suggestive campaign of this nature has just been completed by the Colorado State Committee for the Control of Cancer. During the last few weeks of 1919 the committee's lecturers delivered twenty-two talks on the subject of cancer control which were heard by about 4,000 individuals. Aside from one before the State Medical Society and another to hospital nurses, the following audiences were addressed, which shows the diversity of the public reached: The State Federation of Women's Clubs, employees of five department stores, employees of three industrial concerns (one a group of 1300 miners), the State Educational Association, State Librarians' Association, and State Congress of Social Workers; a Ladies' Aid Society, one church congregation, and a Parents' Association in a high school. This indicates the types of audiences which may be addressed to advantage upon this subject and when we add to them, chambers of commerce, manufacturers' and merchants' associations, trades councils and unions, ministerial and other clerical groups, fraternal orders, Y. M. and Y. W. C. A.'s, civic and study clubs, all of which have been used from time to time as mediums through which to disseminate the hopeful message of cancer control, we begin to grasp something of the immensity of the work before us and to appreciate that the word "campaign" is most aptly chosen.

I have left for the last, the consideration of one of the most important, if not the most important, and useful of all coöperating agencies through which such a cancer committee can operate. I refer to the public health departments, state and local. Having been a health officer myself, I am cognizant of the misunderstandings which sometimes exist between the organized profession and these official departments. This is not the place nor the time to even sketch the underlying causes of this unfortunate situation. It is enough at this time to state that in the fight against cancer, the state medical societies and state and local boards of health should work together as a unit. With the prestige and funds which well organized and well supported health departments can command, no chance for coöperating with them should be lost. Through their regular publications, exhibit and lecture bureaus as well as through their nursing staffs, demonstration clinics, health centers, etc., a unique opportunity is offered for the most effective kind of team work. It is not difficult to show to boards of health the desirability of such coöperation when the possibility of cutting down the death rate from this disease through intensive educational methods is properly presented.

One last word, and that, one in which I am sure the editors of medical journals will entirely concur. In making suggestions for carrying out a program of activities, particular stress should be laid upon the desirability of free use of printer's ink. After all, it is the general public that the majority of meetings are designed to reach. Success in the control of this disease can be said to be in direct proportion to the number of persons who have been persuaded by the dissemination of information to give immediate attention to suspicious symptoms. The medical man is the one who must prepare and deliver the facts, for only he has them. He should then be assured the widest possible hearing and his audience can be increased manyfold by a well organized and smooth working bureau which will see that his address is digested and reprinted in the public press. Where one hears the lecture, hundreds read the papers. If the information is valuable for people to hear, it is equally valuable for others to read. A sub-committee on publicity is therefore most essential.

I will now leave this matter for your consideration, feeling sure from the experience of the Society in the past, that this additional assistance on the part of medical editors will strengthen the bond of coöperation existing between your association and that which I represent. As an example, I may cite the splendid results of propaganda publications prepared and distributed for popular use by the American Medical Association, some of them in coöperation with our Society. I appreciate that for medical editors to take up this work means a new line of endeavor, and I recognize the difficulty of taking the first step in a new venture. However, I can assure you that if entered into with the spirit which the importance of the service merits, there is no one thing which medical journals could undertake which would so far advance the campaign for the control of this disease. You may feel sure that the American Society for the Control of Cancer is most anxious to assist in any way in which it may be privileged to do so.

## New England Surgical Society

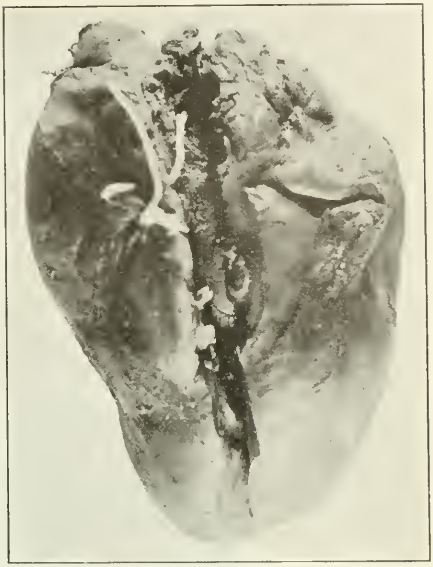
## FOREIGN BODIES AS A CAUSE OF APPENDICITIS.

By S. A. Mahoney, M.D., Holyoke, Mass.

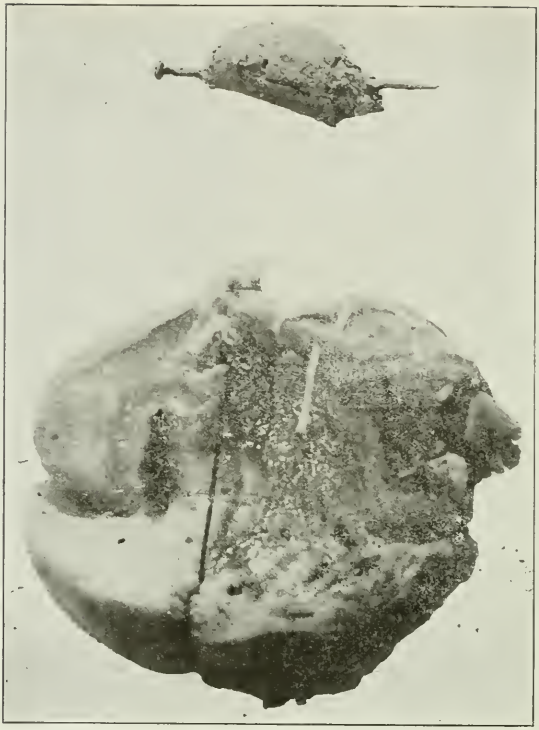
Illustrative of the above heading is a case which occurred during my term of service at the Holyoke City Hospital during the present year.

### CASE WITH SPECIMEN.

N. B. Age, 4 years. Sent into the hospital by Dr. E. P. Bagg. Parents of child sent him to a clinic held at a municipal milk station in consequence of abdominal pains, paroxysmal in character and occasional vomiting. The patient walked into the clinic, and afterwards into the hospital. The examination by Dr. Bagg disclosed a very tender tumor, low down on the right side. A diagnosis of acute appendicitis was made, and immediate operation advised. On entrance to hospital, patient sat chewing gum while arrangements were made for his entrance, and walked to the ward without any apparent pain. When seen by me at 9 P.M., he was soundly asleep and with difficulty aroused, except by palpating his abdomen. He was acutely sensitive to touch over the entire right side, especially marked over the site of the appendix. A tumor about the size of an ordinary hen's egg was easily palpable, a little lower down and closer to the pelvic bones than McBurney's point. In consequence of the normal temperature, 110 pulse, 20 respiration, and the evident comfort of the child when left alone, it was decided to operate the next morning. However, Dr. Bagg, happening into the hospital just after my examination, regarded the case as so acute, that he advised an immediate operation. Accordingly a midnight operation was performed. The opening of the abdomen disclosed a clean peritoneal cavity. Hanging over the pectineal line, dipping into the true pelvis and very adherent to the neighboring pelvic bone and small intentines, was an egg-shaped tumor, brawny red in color, looking in shape and size like an infant's heart, with the base attached to the cecum. This base was so broad that it encroached on the ileo-cecal junction, so that considerable care had to be exercised in dissecting it free from the ileum. Much difficulty was encountered in freeing it from the pelvic bones and coils of adherent small intestines. A No. 2 iodized cat gut ligature was thrown about lumen of appendix, when I had cut through the inflammatory tissue, the omentum was stitched in such a manner that it covered the raw surfaces, and the abdomen was closed without drainage. The child made practically an uninterrupted recovery and was discharged from the hospital 3½ weeks after entrance.



The presence of the pin in the lumen of the appendix was not discovered until the end of the operation, when the specimen was opened. The pin lay parallel to the long axis of the appendix with its point towards the cecum and its head lying at the tip. The shaft of the pin was surrounded by a hard fecal concretion about the size of a peanut, with the point of the pin uncovered, ready to start something at the earliest possible opportunity.



In looking over the literature, many interesting questions arise, such as the possibility of diagnosing a foreign body as the etiological factor in a given case of appendicitis. In this case, the history would be of no assistance, as the closest questioning failed to elicit even a suspicion that the boy had ever swallowed a pin.

The following group of symptoms, however, might suggest such an etiological factor; lack of temperature, colicky intestinal pains, occasional vomiting, apparent well being in the intervals, no loss of flesh, regular bowels, duration of disturbance which was about a month, and then the physical examination disclosing a tender tumor fairly well fixed in the neighborhood of McBurney's point.

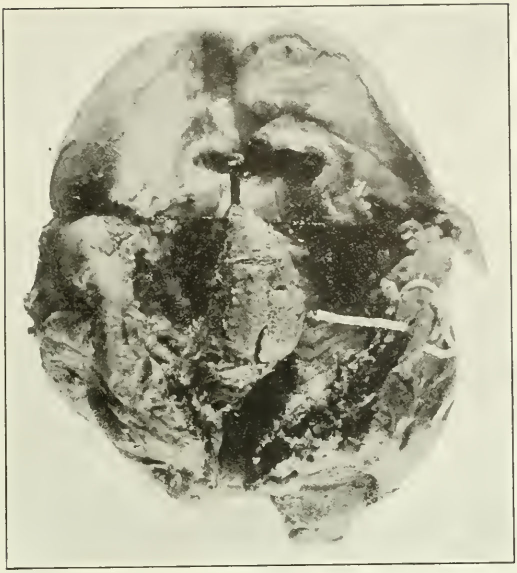
The duration of time that the pin was in the appendix, is also open to conjecture. From the thick walls of the specimen, it certainly must have been there for a very long time, evidently from the creeping period of the boy's existence, which would be about three years.

Relative to the literature on this subject I find, that pins are by far the most common of the foreign bodies found in the appendix. Out of a list of 74 cases of true foreign bodies I find that pins occur in 40 of them. The other foreign bodies found are:

| | | | |
|---|---|---|---|
| Fruit seeds | 7 | Stone | 1 |
| Shot | 3 | Solder | 1 |
| Iron filings | 3 | Barley grain | 1 |
| Beans | 2 | Gall stones | 1 |
| Piece of bone | 2 | Worms | 1 |
| Calcareous matter. | 2 | Chocolate nut | 1 |
| Clove | 1 | Bristle | 1 |
| Oat hulls | 1 | Die (parchesi) | 1 |
| Date seed | 1 | | — |
| Piece of wood | 1 | Total | 34 |
| Berry seeds | 1 | Pins | 40 |
| Cherry stones | 1 | | — |
| Raw chestnut | 1 | Total | 74 |

Thus the pins compose 55.5% of all cases of true foreign bodies found in the literature.

It would naturally be supposed that pins would be found mostly in the appendices of women. This, however, is not the case, for most of the pin cases occur in men. Authori-



ties differ as to the frequency of occurrence:

No. 53. DeForest states that pins are four times as common in males as females.

No. 51. Mitchell states that the men are twice as susceptible to swallowing pins as women, his cases being males, 17; females, 9.

In looking over the literature I find that the cases stood: Males, 25; females, 14. This is more in accordance with No. 51—Mitchell's conclusions.

According to No. 42—H. A. Kelly—only two cases occurred in seamstresses.

The majority of pin cases occur in younger children. The cases in the literature show that out of the 40 cases 16 were under 10 years of age. No. 51 Mitchell reports a pin in a baby of 15 months.

The earliest probable case is that described by Ruysch in 1691 (No. 51 Mitchell).

The first absolutely authentic case of a pin in the appendix is that of Dr. Mestivier of Bordeaux in 1757 (No. 51 Mitchell).

Authorities differ as to the total number of cases of foreign bodies in the appendix known to date.

No. 53. DeForest states, "Since 1759 only 30 cases of true foreign bodies in the appendix have been reported—a pin was the most frequent."

In my survey of the available literature I find 70 cases of what I considered true foreign bodies in the appendix.

The following table taken from *Bernard et Vignard* No. 8, gives a total of 86 cases.

FOREIGN BODIES KNOWN AS CAUSE OF APPENDICITIS.

| | CASES |
|---|---|
| Before 1880 | 25 |
| 1880 to 1895 | 19 |
| 1895 to 1910 | 42 |
| TOTAL | 86 |

Murphy reports foreign bodies in 3.5% of cases

Fitz (1886) reports foreign bodies in 12% of cases.

No. 51, J. F. Mitchell reports 7% foreign bodies in 1400 cases.

Fowler had only three foreign bodies present in 2,000 cases.

DeForest, No. 53, encountered no foreign bodies in several thousand cases.

In speaking of foreign bodies as the exciting cause of appendicitis J. B. Deaver, No. 23, makes the statement that "they are very rare as an exciting cause."

Osler & McCrae, No. 57, draw practically the same conclusion as does Dr. Deaver, No. 23.

On the other hand, the following list quoted from Bernard & Vignard, No. 8, gives the results of foreign observers:

| | Cases | Cases of Foreign Bodies |
|---|---|---|
| Talamon ............... | 760 | 60-100 |
| Femmek ............... | 105 | 55 |
| Fuern (1895) ......... | 171 | 64 |
| Guinard ................ | 200 | 24 |
| Lengfeld ............... | 459 | 17 |
| Rermersdi Rostegen.... | 5557 | 2 |
| Berthelier (1895) ...... | 29 | 7 pins |

The high results obtained here seem out of of proportion with the results mentioned previously in this paper. However authorities differ as to what should be classified as a foreign body. Fecal concretions are excluded from my list. Undoubtedly several of the authorities above mentioned must have included fecal concretions among their list of foreign bodies in order to obtain such high results.

The opinions held by the various men differ in regard to the correlation between the severity of the attack and the presence of a foreign body. There is good evidence, however, that in the majority of cases, the foreign body excites a chronic inflammatory reaction, which ultimately results in an acute process or leads to abscess formation.

Kelly, No. 42, states that pins and other foreign bodies are generally a long time in the appendix before the acute process develops. Even then, the foreign body finally determines the site of perforation rather than inducing the inflammatory attack itself.

Mitchell, No. 51, makes mention that "all types of appendicitis arise from pins. Some gave rise to only mild symptoms and may lead to chronic appendicitis with recurrent attacks or long continued pain (cites 7 cases) or only a feeling of uneasiness in the right iliac region which may last for months or years and perhaps end in an abscess. Most often there is rapid perforation and abscess formation following the first symptoms."

Mitchell, No. 51, reports 28 cases of pins, of which two caused a perforation of the cecum.

In the 40 cases of pins in the literature I find the attack to be acute in 24 cases, chronic in 14; no mention was made of the severity of the attack in two. This gives a percentage of 60% acute and 35% chronic.

The mortality in these pin cases is very high. In 38 cases in which the result was mentioned there were 21 deaths to 17 recoveries, a percentage of 55.2% against 44.8% recoveries.

Before 1895 the percentage of deaths to recoveries was much greater, there being 13 deaths and only five recoveries. Deaths, 72.2%; recoveries, 27.7%.

In the period 1895-1917 the deaths were eight and recoveries 12. Deaths, 40%; recoveries, 60%.

The position of the pin in the appendix is quite interesting. With regards to this, Mitchell, No. 51, states as follows:

"The pin may enter by its head or point. It is usually straight, lying in the lumen of the appendix and perforating with its point. In one or two instances, it lay across the lumen and perforated one wall with its head, and the opposite with its point. Dr. McBurney removed an appendix, with two pins lying side by side and perforating the opposite walls of the appendix in this manner."

The condition of the pin varies according to its recentness of swallowing and is usually covered with a fecal concretion.

Mitchell, No. 51, says, "The pin may be free from deposit, rusty or corroded. It is usually the nucleus of a fecal concretion, which covers the head and most of the shaft, leaving the point free. There is frequent association of abscess of the liver (7 cases).

Abscesses were present in practically all of the cases. Only five out of the 36 cases, in which the presence or absence of pus was mentioned, had no pus.

Mitastatic abscesses were rather commonly present. There were nine abscesses of the liver out of 40 cases. This means that about one-fourth of the cases had metastatic abscesses.

One of the peculiarities of these cases is the fact that in the majority of them there was no definite history of swallowing the pin. Only three out of 40 cases had any such knowledge.

### SUMMARY.

1. Pins are the most frequent of foreign bodies found in the appendix.
2. Pins occur more often in the males than in females (2-1). Occur most frequently in children under 10 years.
3. Cases comparatively rare, only 40 pins in 160 years, possibly 228 years, if case of Ruysch (1691) is considered the first case.

4. Only 86 cases of true foreign bodies, as maximum, mentioned in literature.

5. Cases of true foreign bodies range from about 0.2% to 12% among American observers. The per cent. is higher among foreign observers—as high as 50%. Probably due to the fact that these authorities classify fecal concretions as a foreign body.

6. The pin generally lies quiescent in the appendix a long time, and

7. The attack causing operation generally is acute. The mortality is exceedingly high. Pin may enter by head or point, lie transversely or parallel to axis of appendix.

8. Appendix generally perforated and with point of pin, for the pin is generally covered with deposit with point left free.

9. Abscess formation generally present and generally fatal before 1895.

10. Metastatic abscesses of liver rather commonly present.

11. Generally no history of swallowing pin.

### REFERENCE.

[1] Ainger, W. B.: Shot in the Vermiform Appendix Revealed by X-ray. Brit. Med. Jour., 1919, Vol. i, p. 575.

[2] Asbby, H.: Pyaemic Abscess of the Liver Secondary to Ulcer of the Cecal Appendix. Lancet, 1879, Vol. 2, pp. 649.

[3] Baird, E. H., and J. P.: Some Unsettled Points in the Etiology of Appendicitis. Jour. Tenn. Med. Assoc., Vol. xi, 1918-19, p. 310-14.

[4] Barnet, W. H., and Macfie, J. W. S.: A Case of Appendicitis Excited by a Clove. Lancet, Vol. ii, 1907, p. 502.

[5] Battle, W. H.: Structure and Traumatism of the Vermiform Appendix. Lancet, Vol. ii, 1907, pp. 501-505.

[6] Beach, H. H. O.: Foreign Bodies in the Appendix Vermiformis Peritonitis, New York Med. Jour., 1871, Vol. xiv, pp. 397-490.

[7] Bell: An Appendix Containing an Ordinary Pin as the Exciting Cause of a Perforation. Canada Med. Record, Vol. xxiii, 1894, p. 33.

[8] Berard, L., et Vignard, P.: L'appendicite. Paris, 1914. Chap. 4: Corps étrangera, pp. 80-88.

[9] Biggs, H. M.: Impaction of a Foreign Body in the Vermiform Appendix. Med. Rec., 1888, Vol. 33, p. 721.

[10] Bland, Sutton J.: On the Effect of Perforation of the Colon by Small Foreign Bodies Especially in Relation to an Epiploic Appendage. Lancet, Vol. ii, 1903, pp. 1148-51.

[11] Briddon, Dr.: Ulceration of Vermiform Appendix from Foreign Body. New York Med. Jour., 1875, Vol. xxi, p. 52.

[12] Boussi: Bull. Soc. Clin. de Paris, 1878, Vol. ii, p. 15.

[13] Boyd, J.: Foreign Bodies in the Vermiform Appendix. Brit. Med. Jour., Vol. i, 1912, pp. 828, 829.

[14] Chaput, Monsieur: Perforation de l'appendice ileo caecal par corps étranger: peritonite suppurée: phenomènes d'étranglement: laparatomie: mort. Bull. Soc. Anat., 1882, Vol. lvii, pp. 279-284.

[15] Chase, C.: Etiology of Appendicitis. Am. Jour. Obstet., 1916, Vol. lxxiii, pp. 444-449. Fowler shows three in 2090 cases; Johns Hopkins Hospital shows four in 1900 cases.

[16] Cliquet, M.: Peritonite aigue consecutive à une perforation de l'appendice caecal par un corps étranger.

[17] Coleman, W.: A Piece of Bone in the Appendix Vermiformis. Med. Rec., 1895, Vol. xlviii, p. 639.

[18] Colmer, P. A.: Perforation of Appendix Caeci by a Pin. Lancet, Vol. i, 1895, p. 745.

[19] Cotton, J.: Impaction of Foreign Matter in the Vermiform Appendage, Terminating in Perforation and Sudden Death. Statis. Rept. of Health of Navy, London, 1864, p. 218.

[20] Craig, W. H.: A Case of Concretion Composed of Berry Seeds and Fecal Material in Appendix Vermiformis, with Consequent Ulceration, perforation, peritonitis, autopsy. Albany Med. Annals, 1887, Vol. iii, pp. 279-281.

[21] Daland, J.: Appendix Vermiformis with Pin in Site, Producing Interstitial Appendicitis. Proc. Path. Soc. of Phila., 1897, N. S. 1, p. 55.

[22] Danseaux: L'appendicite aigue par presence de corps étranger; perforation de l'appendice en un point eloigné de corps étranger; peritonite aigue; autopsie. Bull. Soc. Anat., 1893, Vol. lxviii, pp. 359-361.

[23] Deavers, J. B.: Appendicitis, Fourth ed., N. Y., 1913. Foreign Bodies, p. 165.

[24] Ferrier, J.: Perforation de l'appendice ileo-caecal determiné par la presence d'un corps étranger. Bull. d'anat. et do physiol. de Bordeaux, 1882, Vol. iii, pp. 272-275; also in Jour. de méd. de Bordeaux, Vol. xiii, 1883-1884, pp. 162, 163.

[25] Duckworth. P., and Langton, J. (Baker): Removal by Operation of Gangrenous Appendix Vermiformis. Brit. Med. Jour. Vol. i, 1889, pp. 1347-1348. Pin.

[26] Faure, J. L.: Sur les causes et la fréquence de l'appendicite chronique. Presse méd., 1917, Vol. xxv, pp. 369-371.

[27] Firkit, C.: Ulceration de l'appendice vermiforme par un noyau de fruit; perforation; peritonite aigue. Ann. Soc. Méd. Chir. de Liege, 1882, Vol. xxi, p. 25. Autopsy.

[28] Fraser: Foreign Body in Vermiform Appendix; Perforation; Peritonitis; Death. Glasgow Med. Jour., 1883, Vol. xx, p. 381.

[29] Formad, H. F.: Two Cases of Perforation of the Vermiform Appendix Due to Foreign Bodies. Trans. Path Soc. of Phila., 1887-89, Vol. xiv, p. 81.

[30] Gauther, L.: Quelques faits de corps étrangers de l'appendice caecal simulant l'étranglement interne. Rev. méd. de la Suisse-Romande, 1883, Vol. iii, pp. 133-139.

[31] Gay, G. W.: Foreign Body in Appendix; Laparotomy; Death. Med. and Surg. Reports, Boston City Hospital, 1889, 4 s., p. 214.

[32] Harley: Diseases of the Liver. 1883, p. 846.

[32] Hevin, M.: Précis d'observations sur les corps étrangers arrêtés dans l'esophage et dans la trachea avec des remarques sur le moyen qu'on employe, ou que l'on peut employer pour les enfoncer ou pour les retirer. Mem. l'Acad. Royale de Chir., Vol. i, pp. 444-604. 1743.

[34] Hildebrandt, Dr.: Perforation des Processus V. durch einem Kothstein. Deut. med. Wochenschr., 1888, Vol. xiv, p. 564.

[35] Houston: Death Caused by a Foreign Body in the Vermiform Appendix. Dubl. Med. Press., 1840, Vol. iii, pp. 333-336.

[36] How, F. A.: Foreign Body in the Appendix; Death. BOSTON MEDICAL AND SURGICAL JOURNAL, 1860, Vol. lxiii, pp. 231-233.

[37] Hughes, J. S.: Fatal Peritonitis Consequent on Perforation of the Vermiform Appendix from Foreign Bodies in that Tube. Dubl. Hosp. Gaz., 1858, Vol. v, p. 36.

[38] Joffroy: Perforation de l'appendice ileo-caecal par un épingle. Bull. Soc. Anat., 1869, Vol. xlv, pp. 512-523.

[39] Kales, J. W.: Foreign Bodies in the Appendix. Med. Rec., 1895, Vol. xlvii, p. 446.

[40] Kammerer, F.: Pin in the Appendix Vermiformis. Ann. Surg. 1895, Vol. xxii, p. 274.

[41] Keen, W. W.: A Case of Appendicitis in Which the Appendix became Permanently Soldered to the Bladder, like a Third Ureter, Producing a Urinary-Fecal Fistula. Ann. Surg., 1898, pp. 243-251. Discussion p. 252.

[42] Kelly, H. A.: Appendicitis. New York, 1909.

[43] Lee, H.: Some Unusual Cases. Lancet, Vol. ii, 1897, p. 536.

[44] Legg, W.: Ulceration from a Pin in Vermiform Appendix. St. Barth. Hosp. Repts., 1875, Vol. xi, pp. 86-90.

[45] Le Guern, J.: Contribution à l'étude de l'appendicite par corps étrangers. Paris, 1893.

[46] Lewis, A.: A Statistical Contribution to Our Knowledge of Abscess and Other Diseases Consequent upon the Lodgement of Foreign Bodies in the Appendix Vermiformis, with a Table of 47 Cases. N. Y. Jour. Med., 1856, Vol. i, pp. 328-353.

[47] Long, F. A.: Foreign Bodies. Nebr. Med. Jour., 1918, Vol. iii, p. 99.

[48] MacDougal, J. A.: Some Thoughts and Observations Regarding Appendicitis, Especially when Appearing in Its Actual Forms. Lancet, Vol. i, 1903, pp. 592-508.

[49] McPhedran, A., and Caven, J.: Lodgement of a Foreign Body in the Appendix Vermiformis. Death from Pyoemia. Canad. Pract., 1895, Vol. xx, pp. 180-182.

[50] Melchior, L.: On appendicitis e corpora aliens. Nord. Med. Ark., Vol. l, afd. 1, No. 15, pp. 1-15, 1918.

[51] Mitchell, J. F.: The Presence of Foreign Bodies in the Vermiform Appendix. Johns. Hopkins Hosp. Bull., 1899, Vol. x, pp. 35-40.

[52] Mustivier: 1759.

[53] De Forest, H. P.: Causes of Appendicitis. N. Y. Med. Jour., 1917, Vol. cvi, pp. 501-502.

[54] Nelson, W.: Cases of Inflammation of the Appendix Vermiformis from Gall Stones Lodging in it. Brit. Amer. Jour. Med. and Phys. Sci., 1846-1847, Vol. ii, p. 257.

[55] Noyce, R. F.: Death from a Raisin Seed. Detroit Rev. Med. and Pharm., 1875, Vol. x, pp. 30, 31.

[56] Officer, D. McM.: The Presence of a Pin in the Vermiform Appendix of a Child, and its Value. Intercol. Med. Jour. of Austral., 1898, pp. 229-231.

[57] Osler and McCrae: Modern Medicine, Vol. iii, 1916. Foreign Bodies, pp. 360, 361.

[58] P. (A. A.): Death Caused by Himbricords in the Appendix Vermiformis. Transylvan. Med. Jour., 1849-1850, Vol. i, p. 323.

[59] Park, R.: Two Cases of Foreign Bodies Found in the Appendix. Med. Rec., 1895, Vol. xlvii, p. 345. (Pins.)

[60] Payne, J. F.: Two Cases of Suppuration in the Liver Consequent on Irritation of the Appendix. Path. Soc. of Lond., 1870, Vol. xxi, pp. 231-235. (Pins.)

[61] Parrot, J.: Accidents remontant à douze ans et dues à la presence d'une épingle dans l'appendice vermiforme. Bull. Soc. Anat., 1853, pp. 54-57.

[62] Pepper: Perforation of the Appendix Vermiformis Caused Apparently by the Impaction of a Grape Seed. Trans. Coll Phys., Phila., 1841-1846, Vol. i, p. 206.

[63] Price, J.: Case of Lodgement of Foreign Body in the Appendix Vermiformis. Med. Reporter, 1855, Vol. iii. p. 72.

[64] Prescott, O.: Case of Fatal Colic from the Lodgement of a Chocolate Nut in the Appendix Vermiformis. New Eng. Jour. Med. and Surg., 1815, Vol. iv, pp. 221-226.

[65] Rivarola, R. A., and Sein, A.: Pin In Child's Appendix. Semana Med., 1919, Vol. xxvi, p. 596.

[66] Roberts, W. O.: A Case of Strangulated Caecal Hernia with a Pin in the Appendix. Am. Pract. and News., 1896, Vol. xxi, pp. 491-493.
[67] Rolleston, H. D.: Pin Perforating the Vermiform Appendix. Trans. Path. Soc. of Lond., 1898, Vol. xlix, p. 106.
[68] Ruysch: Observationum Anatomico-Chirurgicarum. Anrst. 1691, observ. 1, x, p. 71.
[69] Shoemaker, G. E.: A Common Pin in the Vermiform Appendix, with Secondary Abscess of the Liver. Trans. Coll. Phys., Phila., 1892, third series, Vol. xiv, pp. 214-216.
[70] Samberger, F.: Zur. Aetiologie du Appendizitis. Wien. med. Wochen., 1916, Vol. lxvi, pp. 14-21.
[71] Southam, F. A.: Cases of Perityphlitic Abscess of Caecal Region. Brit. Med. Jour., Vol. i, 1898, pp. 1130, 1131.
[72] Syms, P.: Pin in the Appendix Causing Chronic Appendicitis. Ann. of Surg., 1896, Vol. xxiii, pp. 604, 605.
[73] Thornton, S. C.: Inflammation and Ulceration of the Appendix Caused by an Orange Seed; Fatal Peritonitis. Am. Med. Weekly, 1874, Vol. i, pp. 305, 306.
[74] Thurman: Hernia and Enlargement of the Vermiform Appendage of the Caecum; Faecal Abscess and Fistula; Complete Recovery. Trans. Path. Soc. of Land., 1848-1850, Vol. i, p. 269.
[75] Tuvignot: Corps étrangers introduits dans l'appendice caecal; perforation gangreneuse; peritonite; mort neuf jours àpres. Bull. Soc. Anat., 1840-1841, Vol. xv, pp. 382-384.
[76] Vander Veer, J. N.: Bird Shot Found in the Appendix. N. Y. State Jour. Med. 1916, Vol. xvi, p. 460.
[77] Waldon: Case of Abdominal Inflammation with a Foreign Body in the Appendix Vermiformis. Midland Med. and Surg. Reporter, 1830-1831, Vol. ii, pp. 463-466.
[78] Ward, N.: Perforating Ulcer; Sloughing of Part of the Vermiform Appendix; Death. Trans. Path. Soc. of London., 1855, Vol. vi, pp. 197, 198.
[79] Wheat, A. F.: A Die in the Appendix. Amer. Med., Vol. ii, 1906, p. 308.
[80] Whipham, T.: Perforation of Appendix Caeci Vermiformis and Caecum by a Pin. Trans. Clin. Soc. of Lond., 1879, Vol. xii, pp. 58-64.
[81] Willard, F., and Lloyd. J. H.: Appendicitis Caused by the Lodgement of a Pin in the Appendix, with Secondary Multiple Abscess of the Liver. Trans. Path. Sic. of Phila., 1874, Vol. xvii, pp. 40, 41.

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# SOME INSTANCES OF DIVERTICULITIS OF THE SIGMOID OPENING INTO THE BLADDER.

By A. L. Chute, M.D., Boston.

One of the relatively rare conditions met in urinary surgery is that in which, due to a diverticulitis of the sigmoid, we find a communication between the sigmoid and the bladder. I have in my records accounts of four such cases, two of which I published some years ago and two of which have not been reported.

The reported cases both came under my observation in 1910 and an account of these cases was presented at the meeting of the American Association of Genito-Urinary Surgeons in 1911.*

Briefly, the first of these patients was a man of 53, whom I cystoscoped for the late Dr. M. H. Richardson in 1910 and who was operated on by him in March and again in July of that year. Following the first operation there was a period of some months of freedom from symptoms after which the condition recurred and was again operated upon. The patient developed a purulent peritonitis on the fourteenth day after operation and died within 48 hours.

The second case was a man of 60 that I operated upon in July, 1910. He had passed gas by urethra for eight months and bowel contents for a somewhat shorter time. This man had sugar in his urine, which disappeared under treatment. Operation showed a communication between the sigmoid and the bladder, very low in the pelvis. It was separated and the openings in the sigmoid and the bladder closed. This patient died four days after operation. Autopsy showed a collection of pus deep in the pelvis; a part of the line of suture of the sigmoid had given away.

The third case was that of a woman of 66, whom I saw in 1914. She had been constipated for years. Three weeks before I saw her she took a dose of castor oil and following active catharsis she had pain in her bladder with burning urination. She passed gas by urethra and some bowel contents. As a test she ate some figs and recovered the seeds from her urine. The cystoscope showed a small opening low down in the bladder on her left, into which a ureter catheter could be introduced 1½ inches and from which bowel contents now and then appeared. The patient was unwilling to submit to operation and died in 1915, probably of some intercurrent disease, said to be "septic poisoning and arteriosclerosis."

The last case of this sort that I saw was of especial interest and I shall report it in detail. It concerned a man of 50 whom I saw in March, 1919. He had the history of a urethritis many years before when he was between 20 and 30 years old. Twenty years before he had had an attack of jaundice, likewise another attack of the same sort five years before. He had recovered from both these attacks under no treatment other than the use of a restricted diet. He had always been constipated and had attacks of rather vague abdominal discomfort, the seat of which was the lower part of his abdomen on the left.

From about the time of his urethritis he had had times when it had been difficult for him to urinate and other times when he had suffered from frequency of urination and from discomfort referred to the region of his bladder. He had believed that this discomfort depended upon a stricture, supposedly the result of his urethritis. He had, however, never received any treatment for this condition. For three or four weeks before I saw him he had had increased frequency of urination, as often as every half hour; also more or less difficulty in emptying his bladder, together with discomfort referred to his left iliac region. Eight days before I saw him he started on a railroad trip of about 100 miles. During the first part of the trip he had great frequency as well as difficulty and before arriving at his destination was absolutely unable to void although he had constant tenesmus and desire. On his arrival he placed himself under the care of one of the well known local medical men who sent him to a hospital. There was difficulty in catheterizing the patient and only a small amount of urine was obtained. That night the patient had a chill. For a week he remained in the hospital with an elevated temperature and rapid pulse; he had occasional chills during this time. Also he passed relatively little urine during this time. When I saw this man, a week after the onset of his attack, he had been moved to his home. His temperature ranged from 100° to 103°, his pulse rate was usually somewhat over 100. He had constant desire to void but considerable straining produced nothing but a little pus. Examination showed that the patient had a dry, brownish tongue; his prostate was negative; I could feel nothing in his loins. There was a little tenderness in the left iliac region as well as a vague resistance there. He was catheterized without difficulty and his bladder found to be empty. I supposed that this patient had a suppression of urine of unknown origin and sent him to a hospital where he was given salt solution under the skin as well as large quantities of water by mouth. Because of the story of difficult urination a retention catheter was placed in his bladder. The next morning it was found that he had passed only a very few ounces of urine. Changing the catheter I got a little puff of gas from his bladder, which also contained some very foul fluid, evidently fecal. Rectal examination with a catheter in place failed to show any opening between the bladder and rectum. The inference was that this man had had a diverticulitis of the sigmoid which, being adherent to his bladder, had given him his urinary symptoms of many years standing, that had been supposed to have depended upon a stricture of his urethra; that on the day he went out of town a rupture of the diverticulitis into the bladder had taken place. The irritation of the bladder with the bowel contents produced the frequency and tenesmus while his supposed suppression was in reality the emptying of his bladder contents into the sigmoid through the fistula.

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* Transactions of the American Association of Genito-Urinary Surgeons, 1911, Vol. vi, p. 86.

This patient was kept under observation for several days, during which time he had occasional chills with a temperature ranging from 101 to 103 and a considerably increased pulse rate. Examination failed to find any cause to satisfactorily account for his temperature other than the possibility of a pus cavity which might exist between the sigmoid and bladder. This man's condition seemed to be getting worse, so on March 10 I did a laparotomy under spinal. I found no collection of pus in the pelvis but I did find a place deep down in the pelvis where the sigmoid was attached to the bladder rather on its left side. This communication was very short, about ¾ inch; it was separated under double clamps. The opening in the sigmoid was sewed up with two layers of catgut as was also the opening in the bladder. This was rather difficult to do, partly from the induration about the opening and partly from the depth at which it was necessary to work. A rubber wick was carried down to the point of suture. In order to prevent any pressure against the line of the bladder suture that might result from a full bladder, the bladder was opened above and a suprapubic tube was placed in position. No focus of suppuration was found and the man's temperature continued elevated and his pulse rate remained rapid. He was evidently profoundly septic though no focus was evident. He was given large amounts of salt solution under the skin. Two or three days later there appeared a bulging in the perineum with swelling of the scrotum. These were incised and considerable pus evacuated. It was evident that this man's temperature had not been due to any suppuration about the diverticulum, not to his pyelonephritis, but to this collection of pus deep in the pelvis. At the time of operation I found a place in his deep urethra which had either ulcerated from the pressure of an inlying catheter or had been perforated by the passage of a catheter; the cause without reasonable doubt of his pelvic suppuration. A considerable portion of the skin of the scrotum sloughed, leaving the testes almost wholly uncovered; during the process of healing, however, they were completely recovered. The wounds closed up slowly but closed completely in some weeks. Two or three weeks after operation there was a discharge of feces from the abdominal incision. This fecal discharge diminished but reappeared from time to time during the three months he was in the hospital. At the time he left the hospital his urine was perfectly transparent and he was without urinary symptoms; this condition has continued. The man has been at work regularly now for more than a year. When he last telephoned me, some weeks ago, he said there was a little watery discharge from the abdominal sinus but that there had not been any fecal discharge for a good many months.

To me this case is of special interest as it gives us, I believe, a good picture of the behavior of a diverticulitis of the sigmoid, which has become attached to the bladder, at a stage which is rarely if ever recognized and which one would gather from this case, probably takes place long before there is anything like an ulceration through into the bladder. This man for 25 years had had periods of frequency and urgency, combined with difficulty in voiding. His frequency, I assume, was due to the irritation that this condition produced, while his difficulty was probably due to the fact that the mobility of the bladder was interfered with by this diverticulum which attached it to the sigmoid.

Symptoms such as these without any evidence of local disease of the bladder should, I believe, arouse our suspicions as to the possible presence of a diverticulitis of the sigmoid which has become adherent to the bladder. The presence of a constant feeling of discomfort in the left inguinal region, attended with slight tenderness would increase the probability of this condition. It seems to me perfectly possible that in such cases the use of bismuth enemata might allow us to demonstrate by radiographs the presence of a diverticulum of the sigmoid. This I have not, as yet, been able to do.

As regards the etiology of this condition, for the most part diverticula of the sigmoid appear in patients above middle life; a large amount of fat seems to predispose. It is supposed that the formation of diverticula of the sigmoid depends upon fatty infiltration of the intestinal wall, usually under some epiploic appendage and the consequent giving away of the muscular layer. Some are undoubtedly of congenital origin.

From the history of the patient, whose case I have reported in such detail, it seems evident that the condition may exist for a very long time even after the diverticulum has become attached before rupture into the bladder takes place. In this patient we have a history of years of discomfort. In some, as in the first patient described, there is a definite abscess formation which finally breaks into the bladder. In the patient whom I described in detail there was no abscess between the diverticulum and the bladder. Presumably in such cases the tip of the diverticulus adheres to the bladder and ulcerates through without the formation of an abscess cavity. In this individual there was no evidence of any abscess cavity, nothing but a little tube about the size of a slate pencil leading between the sigmoid and the bladder.

As regards the symptoms seen in this condition, the cases have presented the two striking symptoms seen in cases where there is a connection between the bowel and bladder. The first of these is the passage of gas by urethra, which may rarely be simulated by urinary infections with gas producing organisms said to be especially likely to occur in patients whose urine contains sugar. The second and absolutely pathognomonic sign is the passage of bowel contents in the urine. This, of course, is an absolutely definite sign of a connection between the intestine and the bladder but it does not necessarily mean that the connection is the result of a diverticulitis of the sigmoid. The passage of urine from the bladder to the sigmoid, rather marked in this case, varies considerably in different cases, and is hard to estimate. It has relatively little diagnostic value.

In the instances where a vesico-intestinal fistula is due to tuberculosis or malignant disease, the history as well as the cystoscopic appearance is usually sufficient to render the nature of the condition clear. There are instances, however, where one has a tremendous infiltration of the sigmoid, inflammatory in type and due to the presence of multiple diverticula, which may simulate very definitely a carcinoma.

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to the presence of multiple diverticula, which may simulate very definitely a carcinoma. In the light of the case that I have reported, I hope we may be able in certain instances to make a diagnosis of diverticulitis of the sigmoid before such time as it has opened into the bladder. As I have suggested, the instances of bladder irritation without evident disease of the bladder itself, especially when combined with a certain difficulty in voiding without the presence of stricture, and without any defect in the nerve supply of the bladder should awake in our minds the possibility of a diverticulum of the sigmoid which is adherent to the bladder. It is possible that in a certain number of such cases that a radiograph after a bismuth enema will give us definite evidence of such a condition.

The treatment of the condition is purely surgical. The sinus which is usually slightly to the left of the median line and lies down in the pelvis must be found, tied off and the openings into the sigmoid and the bladder closed. Where there are multiple diverticula of the sigmoid with great thickening of the intestine or where there is an abscess between the intestine and the bladder, this closure will be attended with great difficulty; especially is it difficult if there is thickening of the intestine below the origin of the diverticulum. In all cases "adequate" abdominal drainage should be provided, and I believe the use of suprapubic bladder drainage is desirable. The attempts to treat the condition by closure of the fistula from the bladder side have been, as one would expect, without value. In the operated cases that I have seen there has been some leakage of bowel contents and I think it is probable that in few cases of this type will one be able to get a primary union after suture of the opening into the sigmoid. Most of these openings, however, where the primary suture has not held will probably close in time by granulations. In placing the drainage we should remember that we shall probably have fecal leakage.

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## OBSERVATIONS ON CANCER OF THE RECTUM.*

By Ernest A. Wells, M.D., Hartford, Conn.

The writer has undertaken to make a few observations on cancer of the rectum based on the records of 53 cases, for the most part treated at the Hartford Hospital in the last twenty years. His interest has been stimulated by the fact that he has personally been able to follow a few of them over a relatively long period of time. Twelve of them have come under his personal care. Being under the observation of many doctors, the records obtainable are variable. For the most part, they are very incomplete and leave much to be desired. They have been taken, however, *in seriatim.* None have intentionally been omitted.

### SEX.

Of the 53 cases, the sexes are almost equally divided; 26 were males and 27 females. In the Hartwell series 26 were males and 20 females; while in the Cripps series the males outnumbered the females, two to one. In studying the subject of cancer of the rectum, one must constantly think of a possible relation between syphilis of the rectum and subsequent cancer. It has occurred to me to compare data in these 53 cases with similar data in cancer of the tongue, wondering whether it may be possible to demonstrate any similarity in cancers at the two ends of the alimentary canal. One might be led to suppose that there *would* be some similarity because there is much in common in the embryology of the two regions. But in this very first matter of sex, we find a marked difference. In 22 cases of cancer of the tongue, occurring at the Hartford Hospital and recently studied by my brother, Dr. Donald Wells, 20 cases were males and two were females. There must have been just as much syphilis in the rectum as in the mouth and as much in females as in males. These figures seem to argue, therefore, that syphilis is *not* a cause of cancer and the discrepancy in the relative number of the sexes suggests very strongly that the other factor, namely smoking, is the reason for the great preponderance of males in cancer of the tongue. It is interesting in connection with this to remind you that cancer of the tongue does not appear in the literature until about the time of the discovery of tobacco, a date which also coincides closely with the appearance of syphilis in Europe. We should also note here that *benign stricture* of the rectum is very largely confined to women (Cripps 63-7).

### AGE.

The ages at which these patients entered our observation were as follows:

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* Essentially this same article appeared in Surgery, Gynecology and Obstetrics for November, 1920.

Table of Ages.

| | |
|---|---|
| 20-30 | 1 |
| 30-40 | 4 |
| 40-50 | 9 |
| 50-60 | 7 |
| 60-70 | 15 |
| 70-80 | 13 |
| 80-90 | 2 |
| Not stated | 2 |
| | 53 |

It is thus decidedly a disease of advanced age. Yet there appears one case at the age of 22. Dr. John Hartwell also reports one case at the age of 23, and Watson reports cases at 17, 20. 21 and 23 years of age. Cripps reports three under 20 years of age.

That a patient should suffer from cancer of the rectum at 22 seems, however, rather remarkable and perhaps suspicious. Yet the records of this case of ours are rather more complete than *most* of the series and prove to my mind beyond reasonable doubt that it really was a case of cancer of the rectum.

This girl was married, age 22, and first came under our observation August 1, 1908. She had been in the hospital a few weeks previously, and the diagnosis on this admission was ulcer of the rectum. It is recorded that she refused an operation and left against advice. The patient was re-admitted within a week or two. On this occasion the sphincter was stretched and a mass was felt just inside the sphincter bulging into the vagina. A section was removed for microscopical examination and the specimen was reported adenocarcinoma. I have verified the original record of the pathological examination of this section in the laboratory of the hospital within the last few days. Patient again left the hospital against advice.

It appears that she next went to another hospital where the growth in the rectum was removed. The result, however, was unfortunate, as she became bedridden, was unable to lie on her back, and was re-admitted to the Hartford Hospital a year and three months later in a pitiable condition and soon died. The patient lay on her face, a large indurated swelling in the sacral region, the anal orifice closed and a left iliac colostomy taking its place. The left leg was swollen and the patient emaciated.

It is interesting to note that the orthopedists were already at that early date invading the province of general surgery, for it is recorded "Orthopeditians were planning to put patient in extension on inclined plane to make her more comfortable but patient worried so much about it in her weakened condition that she died." At any rate, I think that there is no doubt but that she was a true case of cancer of the rectum.

Our second youngest patient might also come under suspicion of syphilis rather than cancer, the more so, that he is still alive and well, now fourteen years since his operation. (He died in April, 1920 of influenza.) His first symptoms appeared at the age of 31, when he noticed blood in the stools, followed later by griping pains. One year after these first symptoms, he came to me and was referred by me to Dr. P. R. Bolton, my former attending surgeon at the New York Hospital. Dr. Bolton removed a carcinoma involving an area the size of a silver dollar. A modified Krasky operation was done. The tumor was found just within the anus involving the anterior and lateral walls and was removed, leaving the sphincter to a considerable extent intact. "The specimen consisted of a portion of rectal wall 9 x 3 cm. Excepting for a narrow rim of normal gut, the wall was the seat of an oval ulcerated tumor, whose edges were fairly sharply defined. The tumor tissue was confined for the most part to the mucosa but in several places had penetrated to the muscularis. Microscopic examination showed an adenocarcinoma of a not very malignant type." The patient began to increase in weight immediately, but did not regain full control of the sphincter for more than six months. There has never been any sign of return of this cancer and yet it was removed by very conservative methods. There has never been any serious secondary stricture. I believe the explanation of *this* is that the growth did not involve the posterior wall of the rectum and probably the whole circumference of the rectum was not removed. Whereever the rectum is resected and a circular suture done, a stricture always occurs as a result and this stricture sometimes causes almost as much trouble as the original cancer. An end to end anastomosis of the intestine can be made anywhere where it is entirely surrounded by peritoneum, but as soon as we get beyond the rectosigmoid junction and into the rectum proper where there is peritoneum on the anterior surface only, or still farther where there is no peritoneum at all, resection with circular suture cannot be done without producing a stricture. Such a stricture requires constant dilatation to maintain patency. At any rate this case speaks wonders for the possibility of very conservative surgery in localized cancers of the rectum.

### USE OF THE CYSTOSCOPE FOR EXAMINATION OF THE RECTUM.

This raises the question as to how one is to tell whether such a cancer is localized or not. The use of the cystoscope for this purpose was suggested by my associate, Dr. T. N. Hepburn, and I have not run across any other reference to this method of studying these cancers in the literature. But acting on Dr. Hepburn's suggestion, we have used this method a few times in our service at the Hartford Hospital with great satisfaction. The patient is placed in the knee-chest position with the abdomen relaxed. The cystoscope is easily introduced, the rectum washed clear, and filled with water as in bladder examinations. If pains be taken with the washing, it is astonishing what a perfect picture of the growth can be had. And it should be possible to tell with certainty whether or no the malignant ulcer in question involves the whole circumference of the rectum or not.

### CONSERVATIVE SURGERY IN CANCER OF THE RECTUM.

In the 1917 *Collected Papers of the Mayo Clinic*, Dr. Mayo describes the removal of localized papillomatous tumors of the large bowel or rectum by linear incision through the wall of the bowel by the abdominal route and removal of these tumors by conservative methods. The tumors he describes are not actually cancers but they must be at least potentially so as shown by our case No. 21, where a papillomatous tumor was removed through the anus by conservative methods by Dr. A. M. Rowley in 1914 in a patient aged 60. This tumor was regarded at the time of operation as merely a papilloma, but on study in the laboratory was found to have undergone carcinomatous degeneration. This patient left the hospital apparently well. A letter received from the daughter of this man a few weeks ago says, "He never had one sick day from that time till the summer of 1919." From that time on he began to fail. He died November 16, 1919, with symptoms suggestive of cancer of the stomach. This man had lived and been perfectly well for over five years after the removal of an adenocarcinomatous polyp by conservative surgery.

Dr. Arthur Dean Bevan in the Chicago Surgical Clinics for 1917 describes a method by which he removes the coccyx and then slits the rectum posteriorly from the anus up a distance of four inches. This gives him a splendid exposure through which he is able to remove localized carcinomata with the cautery. He then loosely closes this wound and then the wound of approach. *He* says that he has done quite a number of cases by this method during the last five or six years and he believes it is a method that should be adopted in beginning small carcinomata of the rectum without serious involvement. That, if he himself had such a condition, he would prefer this operation done thoroughly to any other. He says that he has a number of cases alive and well two, three and four years after these cautery operations in the lower bowel. It is to be noted that this operation of Dr. Bevan's is practically the same as that described by Mr. Harrison Cripps of London in his long and very remarkable series of cases

The above is about all that can be said in favor of conservative surgery on cancers of the rectum. And it is evident that before conservative surgery can be undertaken in any given case, a fairly accurate knowledge of the locacation and area involved should be determined.

### SLOW COURSE OF CANCER OF THE RECTUM.

There is one other feature, however, to which your attention should be called and that is the *very slow course* which some cancers of the rectum seem to pursue. Such a case is illustrated in case No. 1 of my series.

This woman had had stomach trouble, constipation, and generally poor health for many years. She had had ribbon stools and difficulty in defecation for one year. It is reasonably certain, therefore, that her cancer started at least one year prior to the date of her operation or about January 1, *1903*. She was operated on by Dr. Bolton at the New York Hospital February 8, 1902, at which time he made a posterior approach, resected the rectum containing an adeno-carcinoma, did an end to end suture and established a temporary left inguinal colostomy. "This specimen was the lower 8 cm. of the rectum. A moderately indurated ulcer involved all except 1½ cm. at either end. The mucosa below the ulcer was normal, but that above was indurated, at one point right up to the line of excision. The lumen was reduced moderately, more in the upper than in the middle and lower parts. The sections showed a typical adeno-carcinoma with slight mucoid degeneration. The ulcerated area showed invasion of the muscular coat. At one point the mucosa was involved close to the upper incision.'' This patient was referred to me on her return from New York (May 30, 1904), at which time there was a marked stricture in the rectum about three inches from the anus. She has been closely under my observation ever since.

### PREGNANCY WITH CANCER OF THE RECTUM.

In December, 1906, this woman became pregnant and in the following spring I noticed, first, a softening and reduplication of the scar, and later a definite mass which could be none other than a recurrence of the tumor removed two years previously. After consultation, it was decided to let the pregnancy continue, and in October, 1907, she was *delivered normally* of a *boy who is living* today. The tumor at this time was about the size of a hen's egg. Operation was advised and urged immediately thereafter, but she could not be induced to go through it until February, 1913, over *five years* after the birth of her child. In the meantime, the growth had infiltrated the floor of the vagina and the tissues in front of the sacrum. In April, 1912, Dr. O. C. Smith saw the patient in consultation with me and considered the involvement so extensive as to be inoperable. But in February, 1913, ten years after the original operation and six years after the recurrence of the growth and the birth of her child, she went to New York and was operated on by Dr. William Seaman Bainbridge. He removed the entire rectum and anus, the coccyx and all of the soft tissues in the pelvis back of the vagina, making an entirely new perineum. This woman again resumed her natural life, did her own work, took care of her family, and went out in society. The artificial anus never gave her any trouble, never soiling her clothes or interfering with any of her activities. She never had any further recurrence until *1919*, when she passed the menopause. Pain began in the region of the sacrum and in August of last year she became more or less bedridden from pain. A suspicion of return was of course immediately entertained but it could not be demonstrated with certainty until December, 1919. Dr. Bainbridge came to Hartford and again tried to stay the growth. The patient died December 22, 1919, at least *seventeen years* from the time the growth started. This case in particular has certainly served to impress on me the *very slow rate at which this disease may grow and metastasize*. There was never any reason to think that this patient had any metastasis beyond the immediate growth and this can be asserted *very positively* because at the laparotomy last December, we had plenty of opportunity to study the lymphatics in the retro-peritoneum as well as the liver.

I have seen a number of *other* cases, however, where the course of this disease *seemed* to be *quite* as rapid as is the case in malignant disease elsewhere. I have opened the abdomen several times in patients where symptoms did not go back very many weeks and found the retro-peritoneal lymphatics thoroughly invaded.

### SYMPTOMS.

I have made a study of the early symptoms in the 53 cases of my series with the following results:

| | | |
|---|---|---|
| Pain* | 28 | times |
| Blood in stools* | 27 | " |
| Loss of weight | 19 | " |
| Obstruction to defecation | 18 | " |
| Diarrhea | 11 | " |
| Foul discharge | 10 | " |
| An obvious tumor of the rectum | 8 | " |
| Acute obstruction | 6 | " |
| Incontinence of the feces | 6 | " |
| Piles | 6 | " |
| Urinary retention | 3 | " |
| Urinary fistula | 1 | time |
| Prolapse of the rectum | 1 | " |
| Abdominal tumor | 1 | " |
| And, strange to say, Ribbon stools, only | 1 | " |

I found evidences of syphilis or probable syphilis in the hospital records in five cases, but I believe this is of no particular value because the internes taking these histories were not looking especially for symptoms of this kind either in the individual or in the individual's family history.

In six cases, acute obstruction was the first symptom. In all of these cases, the obstruction had lasted from five to eight days. All did well after colostomy, except the one in which the obstruction had lasted eight days.

### COLOSTOMY.

There may possibly be room for variable opinions as to whether a colostomy in hopeless cancer of the rectum affords sufficient relief to justify it, but there can be but one opinion as to the surgeon's course of action.

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* These two were the predominating symptoms in the Hartwell series also.

If we see a man drowning, we do not consider whether that man's life if restored will be a blessing to himself and those around him. Neither do we consider the chances as to whether the venture will be successful. We throw him a rope if we can, concentrate our minds on the doing and leave the philosophy for the firelight and the pipe dream. Such is the rule of surgery.

I think there can be no doubt, however, that the colostomy in itself, not only relieves obstruction but at the same time decreases very markedly the irritation of the cancerous ulcer and removes a very considerable source of chronic poisoning for the individual by draining the cesspool of dilated colon proximal to the partial obstruction. Dr. Robert Abbe laid *great stress* on these features. The neglected cases are frequently complicated by fistulous tracts and become indurated, septic masses of tissue. These *must* be benefited by emptying the colon and so putting at rest the parts involved. Many writers say that an apparently inoperable case occasionally becomes operable as the result of colostomy.

A great many cases in this series doubtless had their lives prolonged *very materially* by this operation alone. It was done eighteen times as the only surgical measure undertaken. Only two cases made operative deaths.

A colostomy is *not* the dreadful thing we used to think it was. The patient I have previously noted, used a colostomy for sixteen years and I know it was the least of her troubles. She merely wore a belt with a single gauze sponge beneath it. She had full warning when her bowels wanted to move and never soiled her clothes.

One patient on whom I did a colostomy in 1915 wore nothing whatsoever over it and lived eight months thus. This was a permanent colostomy, the sigmoid having been cut in two and the proximal end brought up through the left rectus muscle. My note of June 2, 1916, says, "Colostomy gives absolutely no trouble. Does not even have to wear a pad over it. A retracted, red dimple with hole invisible."

I believe this is the best form of colostomy, making the opening almost as high as the navel, leaving a good loop of sigmoid, and bringing the gut straight through the middle of the left rectus muscle.

I must admit some doubt that any twist or attempt at valve formation can long remain except in the operator's fancy, but perhaps I am mistaken. I have usually drawn the gut straight through the abdominal wall in the simplest, most direct fashion. And, so far as I know, with the exception of my most recent case, who reports that he is wearing a homemade colostomy cup, none of my patients have ever wanted anything more than a gauze pad and belt.

### SYPHILIS OF THE RECTUM COMBINED WITH CANCER OF THE RECTUM.

One case in which I did a permanent colostomy for what I supposed was an inoperable and hopeless cancer of the rectum, remains a conundrum and is well worth relating. This patient, No. 15 of my series, had been operated on for piles in Russia about 1897 and again in Brazil ten years later. She had had condylomata of the buttocks and rectum for many months and had been treated by various doctors in Hartford. On October 25, *1910,* she was referred to me by Dr. Standish, suspecting cancer of the rectum. She went to the hospital and I examined her under ether with the intention of obtaining a specimen for examination. To my surprise, I found it impossible to get even a finger into the rectum. The anus was a tight ring like shoe leather and appeared to be the same further up. Two days later, I made a left rectus incision. My notes read as follows: "The space asterior to the uterus is obliterated by adhesions. The left broad ligament is thick and filled with a fairly hard mass. The rectum loses itself in a mass of adhesions posterior to the uterus. These masses are hard and nodular and undoubtedly represent an inoperable cancer. Simple colostomy done through middle of left rectus. About one-fourth rotation given to the proximal end." The patient was discharged a few weeks later in good condition. I saw this patient two years later. She had had no other treatment than the colostomy above described, but she had come to me again because she had begun to lose weight and suffer pain in the back and legs. She also complained that a certain amount of discharge had recently occurred from the rectum. In December, 1913, I saw this patient again with Dr. H. F. Stoll. I could not understand why my patient had not died, and my mind was giving all the credit for the stay of the disease to the colostomy. But in view of the unexpected result, our minds naturally turned to the possibility that the whole disease might have been due to syphilis. The fact that she had had syphilis and had had syphilis of the rectum was not disputed. I turned her over to Dr. Stoll, therefore, in December, 1913, and he treated her for syphilis then and at intervals since. This patient has been in the Hartford Hospital for various reasons and at various times, but each time the diagnosis has been cancer of the rectum.

In May, 1915, my physical examination shows her as "emaciated." The rectal examination at this time was still as before described. In another history at the hospital, a few months later, she is described as having "oedema of the feet." My notes show that she not only occasionally visited the Hartford Hospital about this time, but other hospitals, including Mt. Sinai. At any rate, she was frequently receiving anti-syphilitic treatments from Dr. Stoll, more especially about 1915, and the latter part of the year she began to feel better. Her pain disappeared, she grew stronger and began to gain in weight again.

For several years now this woman has been in excellent health. And to bring the case up to date with a fitting climax, we now learn that she was again married about four months ago.

First question: Did this woman ever have a cancer?

Second question: Did syphilis cause the cancer or did syphilis cure the cancer?

The rectum is still obstructed by a stony, hard mass. It will scarcely admit a slate pencil.

One conclusion I think may be drawn from this case. If the rectal obstruction really represents the scar tissue of syphilis, the salvarsan may have cured the syphilis but at least it had no effect on the scar tissue. Why cannot we apply this result to the problem of para-syphilitic conditions in the nervous system and judge on the basis of this case that we may cure the syphilitic infection of the brain and cord, but let us bear in mind that we cannot remove the scar tissue, which after all, is the *real pathology* of these conditions.

Because of this case that I have just described, I was extremely interested in a specimen of rectum removed by Dr. Hepburn at the hospital very recently. This specimen was simply a thick leathery tube. The walls of it were one-third or one-half an inch in thickness. It did not suggest cancer at all but appeared as a circular tube composed mostly of fibrous tissue. Its caliber was very small. There was no ulcerating surface and nothing to suggest a tumor. Dr. Hepburn and I both felt sure that the specimen represented an old, diffuse syphilitic stricture but the report *from the laboratory* was *scirrhous carcinoma*.

The sections show "a deep invasion of the connective and muscular tissues by small cuboid epithelial cells following the lymphatics. They are massed in small acini or found in long rows. The nuclei are small and pyknotic but mitoses are few. Only occasionally do these cells form gland tubules." There was no suggestion of ulceration of the rectal surfaces anywhere. Does a specimen like this represent a cancer of the rectum in process of cure by gradual fibrosis and did the case previously mentioned represent a case in which fibrosis actually went through to a cure in the ten years under which we have watched her? I do not think such a view entirely unreasonable. We know that well authenticated cases of cancer in other parts of the body *have* undergone spontaneous fibrosis and cure.

### OPERABILITY AND MORTALITY.

In the series of cases under present consideration there were fourteen attempts at radical surgery; three by the sacral route *only*, made operative recoveries. One case was operated on by the *abdominal* route *only* and made a recovery. Five by the *combined* abdominal and sacral route in *two stages;* also all made operative recoveries. Five where these two routes were combined in a *single* stage operation, all died as a result of the operation. This has been the experience of most operators; that the combined operation in one stage has a very high mortality.

By comparison with the great clinics of the world, our little series of fifty-three cases is small. For the most part, it represents palliative treatment only. In eighteen cases, no operation of any sort was undertaken. Usually this meant that the patient had a sloughing mass in the pelvis without obstruction. In one or two instances, a colostomy which might have been done for relief, was refused by the patient. In four cases, an operation through the anus was done, usually for examination, relief of septic conditions, etc. In only fourteen cases was radical surgery attempted, an operability of 27%.

Cripps of St. Bartholomew's in London reports an operability of 22%, even less than ours (85 out of 380; p. 387).

Lynch of New York reports operation attempted in 60% of his series; more than twice as many attempts as in ours. His operative mortality was 16%; ours was 36%. However, of the last six attempts in the Hartford Hospital only one has died, making it in late years 16.6%.

The Mayo Clinic puts their operability at 53% with a rise to 72% in the last three years. Their mortality has been 15.5%, reduced in the last three years to 12.5%.

It is manifest in all these series of cases that the operability has been increasing rapidly in very recent years and the operative mortality markedly decreasing, except for Cripps' series, in which he had but four deaths in 81 excisions—4.6%.

Wherein have we failed then? Of course in early diagnosis. That goes without saying. Some cases cannot be diagnosed early. Others, it seems, might be.

We have not employed surgery that was *daring* enough.

We have thought of cancer of the rectum as a hopeless condition. It is not. Cripps reports one proved case that lived thirty-one years after radical operation and died at the age of 84. It *can* be cured. Let us have the courage to make the attempt.

### DISCUSSION OF PRECEDING PAPERS.

**Dr. C. A. Porter**, Boston: I think that probably we have all had one or two cases of foreign bodies that have not been reported. I have had one or two cases of pins and pinworms.

**Dr. D. F. Jones**, Boston: In looking up abscesses of the liver due to appendicitis, among 100 cases following appendicitis which I found, there were fourteen cases in which there was a pin in the appendix. That pins should cause abscess of the liver is quite reasonable, for they may easily perforate a vein of the portal system and cause a septic thrombosis, and thus abscess of the liver.

**Dr. S. A. Mahoney**, Holyoke (closing): In connection with the paper there is as complete a bibliography of foreign bodies in the appendix as I could look up. There are cited there, 81 different articles written by various men, concerning the subject. The case quoted by Dr. Smith, of Dr. Gay's, is in the Boston City Hospital Surgical Report, and I think that every case is included in the bibliography. Of course, a lot of cases have occurred that have not been reported. There have been many cases reported as foreign bodies, particularly in the early history of appendicitis, where fecal concretions had been mistaken for foreign bodies. The bibliography is, however, as complete as I could make it.

**Dr. John W. Keefe**, Providence: A case in point came under my observation some eight years ago. A man, about 42 years old, complained of pain and tenderness in the left iliac region. There was tenderness on pressure and rigidity, and one would have said he had trouble with his appendix, but the trouble was on the other side. So that in these cases of diverticulitis the symptoms resemble appendicitis, except that the trouble is on the other side. I opened and found diverticulitis of the sigmoid, and fecal odor, which we get in perforation of the appendix, was pronounced. We drained that wound for some five or six weeks, and finally it healed. Later on, he had another attack of pain and disturbance, and I again opened and drained, feeling it was not wise to do a resection during the acute stage. He convalesced from that, and then I advised him to have a resection done; but he said he was feeling pretty well, and he hesitated to take the risk there would be in resection. He went for some months comparatively free from trouble and then consulted me because he said he had passed some gas from the urethra, and then I found, on examination with the cystoscope, that he had an opening into the bladder, and he passed both gas and feces from time to time through the urethra. We then made an abdominal opening and resected the bowel, and it was necessary to remove so much of the sigmoid and the upper rectum that I could not unite the colon above with the portion of the rectum below, so I made an artificial anus with the proximal end of the descending colon and attached it to the wound on the left side. While removing this mass, I found that the ileum was adherent to the bladder in two places. The opening in the bladder was closed and this man ultimately made a good recovery. It is some five years ago since I operated, and I saw him recently in the city and he manages pretty comfortably with his artificial opening. We also had some x-rays made after a bismuth enema and the plate showed very nicely in his case, the bismuth in the diverticula.

Another case was that of a physician in this city who had a diverticulum of the esophagus, and an x-ray plate not only demonstrated this, but one made of the transverse colon, the descending colon, and the pelvic colon, showed as many as fifty diverticula across the transverse colon, the descending colon and the sigmoid. So these diverticula may be in other parts of the large intestine as well as in the sigmoid, though we know they occur with greater frequency in the sigmoid or pelvic colon.

In order to avoid leakage at the suture line closing the opening in the bladder, a portion of the omentum was stitched over the suture line, as is done in similar intestinal work about the pylorus.

DR. FRANK H. LAHEY, Boston: I have had a similar experience to that of Dr. Chute in a case of diverticulitis of the sigmoid which ruptured into the bladder, demonstrated by cystoscope and urethral catheter. We ligated the diverticulum at its neck, excised it and burned its stump, only to have a recurrence of the rectovesical fistula, either from the same or another diverticulum again rupturing into the bladder.

The treatment of this condition reduces itself into the treatment of diverticulitis in general, a matter which to my mind is far from satisfactory in any of its forms.

The treatment consists of colostomy and irrigation of the sigmoid from the colostomy through to the rectum, resection of the sigmoid and rectum or colostomy with complete side-tracking of the fecal current. The first procedure is of little or no value, as irrigation may temporarily relieve the inflammatory process in the sigmoid and rectum, but cannot cure it as the diverticula remain and still retain the small faecoliths which so commonly occupy these small sacs, with the result that as soon as the colostomy is closed all the elements are again present for a return of the sigmoiditis as it primarily existed.

Resection of the rectum and sigmoid is particularly hazardous in this condition, as the security of the intestinal suture lines in diverticulitis is extremely uncertain, owing to the infected condition of the bowel wall. The misfortune of resection in this condition is that when the condition is acute and one would like to resect the bowel, suture is too risky, and when sufficiently quiescent to permit of the consideration one hesitates to undertake such heroic measures. Permanent colostomy is in about the same relative position. I, personally, would prefer the lesser complications of diverticulitis, such as occasional perisigmoid abscesses or rupture of a diverticulum into the bladder, to submitting to a permanent colostomy for a condition which is in itself not essentially fatal.

DR. ARTHUR T. JONES, Providence: I would like to say regarding this paper, I feel that the question of diverticulitis is an important one, viewed, perhaps, from the standpoint of the man in the smaller community. I think that the men in the larger centers have recognized this condition of diverticulitis, but I believe that in the smaller places many of those cases have been overlooked, and it is well to keep in mind that there is such a condition and to know how to deal with that condition. Only recently I saw a specimen which was removed from a patient for alleged malignancy. A resection was done, and an end to end anastomosis, "for a large malignant mass," the operator said. The specimen was opened, and, I should think, there were probably nine or ten diverticula in it, each one containing three to four fecoliths. That patient had been operated on, and the specimen was resected as a case of malignancy, which they do simulate often. So I feel that it is important for the men in the smaller communities to keep this condition in mind; but I do not feel that to let these cases go on to continued suppuration and to possible breaking into the bladder is wise treatment. Differing from the last speaker, I should be inclined to prefer an artificial anus with that much of perfect cure rather than to be carrying around a condition of diverticulitis, with all of its probable dangers. At any rate, it is a constant menace, and we are going to get future trouble from it if that condition remains.

DR. ERNEST A. WELLS, Hartford: If there are any of you interested in cancer of the rectum who have not read the book of Harrison Cripps, I recommend it to you. He tabulates 435 cases of cancer of the rectum, all private patients. He does not include his ward cases. I know of no series to compare with his. He gives the name, the residence, the initials, pathological findings, operations and subsequent histories. It is most convincing—81 excisions and only four operative deaths. Many of these cases lived for years.

It is a very readable and delightful book.

DR. DANIEL F. JONES, Boston: The question of the speculum aroused a great deal of discussion at one of the meetings of the British Medical Association in which Sir Harrison Cripps said, "You can feel anything with your finger that you can see with the speculum." I do not doubt that a skilled man like Mr. Cripps could feel everything with his fingers that he could see with the speculum. On the other hand, the negative evidence which we get with the speculum is worth a great deal. I certainly do not think the speculum should be discarded. The finding of small flecks of blood high up is something you cannot do with your finger.

## ERRATUM.

We regret that in an article written by Dr. Edwin A. Sanborn and printed in the issue of the JOURNAL for January 6, 1921, in the sentence beginning "When the insurance companies of our state collect," the word "our" is a misprint for "one." Dr. Sanborn was referring to another state, not to Massachusetts.

## NEW APPOINTMENTS.

DR. JAMES C. KIRBY—Assistant in Throat Department, Massachusetts General Hospital.

DR. GEORGE H. POIRIER—Assistant in Throat Department, Massachusetts General Hospital.

THE BOSTON

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## NATIONAL HEALTH COUNCIL.

A conference of a number of the leading national voluntary health agencies was held in Washington on December 10, 1920, at which meeting a National Health Council was created, a form of organization approved, and a constitution and by-laws adopted. The membership of the Council is at present composed of nine organizations, the officers recently elected being as follows: Chairman, Dr. Livingston Farrand; Vice-Chairman, Dr. Leo K. Frankel; Recording Secretary, Dr. C. St. Clair Drake. The election of a treasurer was deferred until further consideration could be given to the whole question of financing the project.

The Council was the outgrowth of many efforts in past years to coördinate national voluntary health organizations, initiated by the American Public Health Association, the American Medical Association, and other agencies. These measures culminated in a special health coördination study carried out during the summer of 1920, under the direction of Dr. Charles J. Hatfield, Dr. Watson Rankin, and Dr. Livingston Farrand, with the financial aid of the American Red Cross. This investigation was conducted by Dr. D. B. Armstrong.

At a preliminary conference in Washington, at the call of Dr. Farrand, on October 18, 1920, the need for such a coördinating body was fully discussed, and a temporary organization perfected, Dr. Farrand acting as temporary chairman and Dr. Armstrong as temporary secretary.

The organization conference on December 10, referred to above, approved the following list of activities, as indicating the legitimate field in which the Council might function:

1. A special information bureau.
2. A legislative bureau.
3. The coördination of health activities.
4. Periodic joint conferences.
5. A statistical bureau.
6. The development of educational health material.

It is anticipated that financial resources, from the Red Cross and from other participants, will be sufficient to enable the Council to establish an office and staff, and to undertake first those activities promising the greatest benefit to member organizations.

In accordance with the bylaws adopted by the Council, each member organization has appointed one representative and one alternate. The original members, with corresponding representatives and alternates, are as follows:

American Public Health Association—Dr. Lee K. Frankel, Dr. M. P. Ravenel.
American Red Cross—Dr. Livingston Farrand, Dr. E. A. Peterson.
American Social Hygiene Association—Dr. William F. Snow, Mr. Bascom Johnson.
Council of State and Provincial Health Authorities—Dr. C. St. Clair Drake, Dr. E. R. Kelley.
Council on Health and Public Instruction of the American Medical Association—Dr. Watson Rankin, Dr. Frederick R. Green.
National Child Health Council—Dr. Philip Van Ingen, Mr. Courtnay Dinwiddie.
National Committee for Mental Hygiene—Dr. Thomas W. Salmon, Dr. George H. Kirby.
National Organization for Public Health Nursing—Miss Edna L. Foley, Miss Mary S. Gardner.
National Tuberculosis Association—Dr. Charles J. Hatfield, Dr. J. Alexander Miller.

The by-laws provided that "other national health organizations may hereafter be elected to membership by two-thirds vote of the members." Provision is also made for advisory or conferring, as well as directly participating members. The International Health Board probably will, together with official agencies such as the U. S. Public Health Service, be associated with the Council in this capacity.

Many important matters before the Council, given partial consideration at the last conference, such as office, staff, budget resources, etc., were referred to a sub-committee made up as follows: Dr. William F. Snow, Chairman; Dr. C. St. Clair Drake, Dr. Charles J. Hatfield, Dr. Lee K. Frankel, with the council chairman, Dr. Livingston Farrand. It is expected that this committee will report its deliberations to the Council at a meeting early in January, following which the organization should be in a position to proceed with the development of its program.

The Public Health Council, representing as it does many prominent national health agencies, should serve as a valuable clearing house and coördinating center, in many fields where common functions are performed. It aims to be an integrating force among independent, autonomous agencies, rather than a merger of such agencies into one organization. It should increase the economy and effectiveness of operation, should eliminate duplication of effort, and should enhance opportunities for sympathetic and constructive public service. Such a movement, through its membership, and through a mutually helpful relationship with State and local voluntary health agencies, should effectively serve the declared object of the National Health Council, which is, "the betterment of health work in the United States."

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## MEDICAL NOTES.

The American Congress on Internal Medicine.—The fifth annual session of the American Congress on Internal Medicine will be held at Baltimore, Md., week of February 21-26, 1921.

The activities of the Congress will be largely clinical. Ward-walks, laboratory demonstrations and group or amphitheatre clinics will be conducted daily by members of the medical faculties of the Johns Hopkins and the Maryland universities.

Further information may be secured by addressing the Secretary-General, 1002 N. Dearborn St., Chicago, Ill.

Award of Red Cross Gold Medal.—At the annual meeting of the general board of the Red Cross Society in Washington on December 8, the Distinguished Service Medal in gold, the highest honor the Red Cross Society can bestow, was conferred in memory of the late Jane A. Delano, director of the department of nursing throughout the war. Miss Delano died in service in Savenay, France, in April, 1919. This is the first time this medal has been conferred, and the action was taken in recognition of the service rendered by the American nurses in war and in peace.

Vaccine for Yellow Fever.—Announcement has been made that Dr. George E. Vincent, president of the Rockefeller Foundation, has authorized the following statements regarding a vaccine for yellow fever:

The discovery of Dr. Hideyo Noguchi, at the Rockefeller Institute for Medical Research, of a vaccine for yellow fever, introduces a new factor in yellow fever control through the possibility of making persons immune to yellow fever by vaccination.

Heretofore work in yellow fever control has been entirely that of prevention of infection by controlling breeding places of the mosquito which carried the yellow fever germ. The isolation of the yellow fever organism, however, has made it possible for Dr. Noguchi to develop a serum which it is believed will reduce the mortality from yellow fever and a vaccine which gives promise of protecting the non-immunes against contracting the disease.

Already vaccination against yellow fever of people going to tropical countries is being made in New York. This work is being done at the Broad Street Hospital with vaccine furnished by the Rockefeller Institute.

The first shipment of vaccine for yellow fever from the Rockefeller Institute to tropical countries was made a year ago when three hundred bottles were sent to Mexico. Other shipments have been made since then, the latest on November 10. All vaccine supplied to Mexico is sent to the Mexican Department of Health which arranges for its distribution.

The Central American countries are so well convinced of the efficacy of Dr. Noguchi's vaccine that they are permitting travel without quarantine detention of those who have been successfully vaccinated.

Resignation of Dr. John B. Watson.—Dr. John B. Watson has resigned from the professorship of psychology at the Johns Hopkins University, a position which he has held since 1908.

Chair of Tuberculosis in Wales. — The following information concerning the founding of a chair of tuberculosis in Wales has been published in a recent issue of *The British Medical Journal*:

"Major David Davies, M.P., founder of the Welsh National Memorial Association for the Prevention of Tuberculosis, has, acting with his two sisters, given the sum of £12,500 to found a chair of tuberculosis in the Welsh National Medical School, University College, Cardiff. The desire is to link up the medical work of the Memorial Association with the Welsh National Medical School, and it was therefore arranged that the professor appointed should also be medical director of the Memorial Association. Colonel S. Lyle Cummins, C.B., C.M.G., Professor of Pathology at the Royal Army Medical College, was on November 12 elected to the dual office. While serving in Egypt in 1907 he was concerned in plans for the prevention of tuberculosis among the Sudanese battalions, which suffered severely from the disease. Afterwards he was assistant professor of pathology at the Royal Army Medical College, and was engaged in superintending the manufacture of typhoid vaccine. At the outbreak of war he went to France as medical officer in charge of General Headquarters, and shortly afterwards was appointed D.A.D.M.S. In March, 1915, he was placed in charge of anti-gas defence, and during the next two years, through the combined labors of many workers, British troops were provided with appliances and a system for gas protection which was approved and imitated by other armies. Colonel Cummins then went to Italy as A.D.M.S., and in 1918 was appointed adviser in pathology at British Headquarters in France. In that capacity he came into close association with the American Red Cross Research Committee; later he was appointed a member of the General Council of the League of the Red Cross Societies. Last year he resumed his duties as Professor of Pathology, R.A.M. College, an office to which he had been appointed in 1914. We believe that this is the second chair of tuberculosis instituted in Great Britain, the other being that held by Sir Robert Philip in the University of Edinburgh."

Requirements of the Johns Hopkins Medical School.—Announcement has been made that at the Medical School of the Johns Hopkins University at least two years of college work, of which one and one-third years should be devoted to inorganic and two-thirds of a year to organic chemistry, will hereafter be required. Each year's course comprises three class-room exercises a week and five to six hours laboratory work. This represents only a minimal training, and three years' work is advised, including one-third of a year devoted to lectures and demonstrations in elementary physical chemistry. After 1923 three years' preparation in chemistry will be required, including at least 240 hours of class-room work and 500 hours of laboratory work. The former must include 60 hours in organic chemistry and a short course in physical chemistry; while the latter must include one year's work in quantitative analysis and 120 hours in organic chemistry.

Alvarenga Prize of the College of Physicians of Philadelphia.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about two hundred and fifty dollars, will be made on July 14, 1921, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English, should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1921.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

No Alvarenga Prize for 1920 was awarded.

The Rev. John Ward and Medicine.—The following address on "The Reverend John Ward and Medicine" was delivered before the Medical Society of London on May 10, by Sir D'Arcy

Power, K.B.E., and was printed in *The British Medical Journal* under the title, "The Pepy's of Medicine."

Ward, who was vicar of Stratford-on-Avon in the reign of Charles II, was versatile and curious, and loved experiment. While in London he had attended the lectures of Sir Charles Scarborough at the Barber-Surgeons' Hall, had visited the hospitals of St. Thomas and St. Bartholomew, and had made inquiries about the cost of foreign medical degrees. He treated gratuitously his parishioners of the humbler ranks, although there was an apothecary and at least one physician in Stratford during his incumbency. From time to time he did a little minor surgery, and he followed the surgical aphorism, "Allways lay a wound open, whether it bee fresh or ulcerated." He seemed to have some idea of the metastasis of cancer, for he spoke of glandules arising in other parts among people who thus suffered. On pleurisy and effusion he wrote: "When an incision is to be made into ye breast open it betwixt ye 3rd and 4th ribb reckoning upwards, yt is just above ye diaphragm, and to yt perhaps apply a Caustick wch is very strong and will eat through ye muscle; yn make an Incision and keep itt open with Tents."

Among the epidemics from which Stratford people suffered during Ward's incumbency were small-pox, measles and plague. The difficulty of distinguishing between small-pox and chicken-pox did not escape him. On plague, he made several observations—one that "itt was observed yt fat people catch itt sooner but lean people died 2 for 1." Some interesting facts about Greatrakes, the "stroker," or faith healer, as he would be called today, were given in Ward's diaries. This man tried his cure on Lady Anne Conway, without success in her case, though he relieved many persons in the neighborhood, so that Dr. Stubbs, the physician at Stratford, wrote a volume in favor of his cure.

From the details given by Ward of the illnesses of his neighbors and parishioners, it was sometimes possible to make a diagnosis, as, for instance, in the case of Dr. Gordon, Bishop of Exeter, and later of Worcester, who died of a stoppage of the urine which was supposed to be stone, but no stone appeared, only "two pieces of flesh growing one against another in ye neck of the bladder yt ye urine could not pass"—doubtless a case of enlarged prostate. Ward occasionally made an effort to generalize from the particular; thus he said: "Whether a great desire to live which some persons manifest uppon their sick beds, as also a willingness to take anything wch before they refused is not a sign they are tending to their long home." In Ward's own opinion, and probably that of his neighbors as well, he was very skillful in urinoscopy, and made many entries on that subject. He distinguished clearly between syphilis and gonorrhea, which were rife at Stratford during his incumbency. Death did not end the interest which Ward took in the bodies of his parishioners. He gave many details of embalming.

Perhaps the most interesting observations in Ward's notebooks were his references to Willis, Lower, Robert Boyle, and others of his contemporaries, who were personally known to him as graduates of Oxford. Lower's classical experiments on transfusion, suggested by Christopher Wren's injection of various drugs into veins were recorded by Ward. Of Sydenham, Ward wrote: "Dr. Sydenham advises a vomit two hours after a gentle dinner; after vomiting hee gives a narcotick potion or Bolus to allay ye tumult yt ye vomit hath made." Other entries related to Sir Charles Scarborough, Sir Francis Prujean, and Sir Alexander Frazier, of whom "the King hath a high opinion . . . and says all ye physicians are fools to him." The properties of opium, laudanum, and antimony were the subject of much inquiry at this time, and Ward made several allusions to these drugs. "Starkey told me that ye sleeping properties of opium may bee separated so as to make itt a hinderer of sleep, but ye sudorific and anodyne qualities cannot."

His observations showed Ward to be a man of great versatility at a time when the prevailing type of mind was versatile. In many respects he was a true disciple of Boyle. He would have made a good practitioner had he given himself entirely to medicine, and he would have advanced the science of physiology. Boyle interested him in the new chemistry, and his restless curiosity led him into metallurgy and the more dangerous quest of the philosopher's stone. But with all this he was a dilettante, spoiled, probably, by the possession of a competency, hampered perhaps by ill health, for he was certainly ruptured, and died at the age of 52, probably of phthisis.

## BOSTON AND MASSACHUSETTS.

Week's Death Report in Boston—During the week ending January 22, 1921, the number of deaths reported was 219 against 253 last year, with a rate of 15.08 against 16.32 last year. There were 27 deaths under one year of age against 48 last year.

The number of principal reportable diseases were: Diphtheria, 104; scarlet fever, 42; measles, 62; whooping cough, 27; typhoid fever, 1; tuberculosis, 35.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 4; tuberculosis, 5.

Total deaths from these diseases were: Scarlet fever, 1; measles, 1; whooping cough, 1; tuberculosis, 8.

## Obituary.

### WILLIAM ELBRIDGE BOARDMAN, M.D.

Dr. William Elbridge Boardman died at his home in Boston, January 11, 1921, aged 76 years. Dr. Boardman was born in Boston April 27, 1844. After graduating from Harvard College in 1865, he entered Harvard Medical School, taking an M.D. in 1868, previously serving as house surgeon at the Boston City Hospital. He was connected with the Gynecological Departments of the Carney and City hospitals, was a member of the Obstetrical Society of Boston, the Massachusetts Medical Society and American Medical Association. He had practised up to a short time before his death.

He is survived by his widow, two daughters, two sons, one of them Dr. William Parsons Boardman, who had an office with his father.

## Miscellany.

### RESOLUTIONS ADOPTED UPON THE DEATH OF DR. SAMUEL J. MELTZER.

At a special meeting of the Council for the New York Society for Thoracic Surgery, the following resolutions were adopted upon the death of Dr. Samuel J. Meltzer:

Whereas, on November 7th, 1920, death removed from the roll of this Society our distinguished colleague, Dr. Samuel J. Meltzer; and

Whereas, during his membership in this young Association, Dr. Meltzer has been an active worker and an ardent and enthusiastic supporter of the objects which called the Society into being; and

Whereas, by his formal communications as well as by his illuminating discussions, in fact by his mere presence, he has been a continuous source of inspiration to its members; and

Whereas, his important discovery of overcoming the dangers of acute operative collapse of the lung by means of his world-renowned "Intratracheal Insufflation" is an epoch-making contribution to thoracic surgery, and

Whereas, Dr. Meltzer was honored with the office of "First President of the American Association for Thoracic Surgery," the offspring of this Society; therefore, be it

Resolved, that in the death of our colleague, the New York Society for Thoracic Surgery has lost one of its most valued and beloved fellows; and be it further

Resolved, that these resolutions be spread upon the records of this Society and a copy be forwarded to his bereaved family and to the medical journals.

Howard Lilienthal, M.D.
Willy Meyer, M.D.
William H. Luckett, M.D.
Carl Eggers, M.D., *Sec'y.*

## Correspondence.

### DR. EARLE'S ESSAY ON THE SURGEON.

31 Massachusetts Avenue, Boston,
January 15, 1921.

*Mr. Editor:—*

Dr. Earle's essay on the surgeon (Microcosmography, London, 1628) is full of interest in connection with a previous communication, "A Meer Dull Physician." It would seem as if the honors were fairly even between the two.

A Surgeon.

"Is one that has some business about this building or little house of man, whereof nature is as it were the tiler, and he the plaisterer. It is oftener out of reparations than an old parsonage, and then he is set to work to patch it again. He deals most with broken commodities, as a broken head or a mangled face, and his gains are very ill got, for he lives by the hurts of the commonwealth. He differs from a physician as a sore does from a disease, or the sick from those that are not whole, the one distempers you within, the other blisters you without.

"He complains of the decay of valour in these days, and sighs for the slashing age of sword and buckler, and thinks the law against duels was made meerly to wound his vocation. He had been long since undone if the charity of the stews had not relieved him, from whom he has his tribute as duly as the pope; or a wind-fall sometimes from a tavern, if a quart pot hit right. The rareness of his custom makes him pitiless when it comes, and he holds a patient longer than our (spiritual) courts a cause.

"He tells you what danger you had been in if he had staid but a minute longer, and though it be but a pricked finger, he makes of it much matter. He is a reasonably cleanly man, considering the scabs he has to deal with, and your finest ladies are now and then beholden to him for their best dressings. He curses old gentlewomen and their charity that makes his trade their alms, but his envy is never stirred so much as when gentlemen go over to fight on Calais sands,* whom he wishes drowned e'er they come there, rather than the French shall get his custom."

Very truly yours,
WILLIAM PEARCE COUES, M.D.

* Note from the text:

"Calais sands were chosen by English duellists to decide their quarrels on, as being out of the jurisdiction of the law. This custom is noticed in an epigram written about the period in which this book first appeared:

"'When boasting Bembus challeng'd is to fight,
He seems at first a very Diuell in sight;
Till more advizde, will not defile (his) hands,
Unless you meet him upon *Callice sands.*'"

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## "IN RE: SURGERY VERSUS CANCER."

Boston, January 12, 1921.

*Mr. Editor:—*

The letter on this subject by Dr. S. W. Little, published in the JOURNAL of December 23, is so well written and plausible that it appears to deserve an answer. It might, in fact, easily deceive those who have not given special attention to its subject, since they would easily recognize its essential truth in some particulars and fail to recognize that after a very convincing statement of these proofs it goes on to conclusions which are based, not upon them, but upon entirely unwarranted assumptions.

It is always easy to prove the obvious, and Dr. Little begins by offering an excellently worded and quite conclusive statistical argument in favor of the universally admitted facts that the cancer death rate is increasing and that its small fluctuations from year to year over the area of the United States are no more than accidental. He not only begins with these easily demonstrated proofs, but, no doubt innocently, constantly confuses the remainder of his letter by reiterative references to these facts in a manner which might lead those not familiar with the subject to conclude that they had some bearing upon the other statements which he makes.

If we analyze the remainder of his letter, it consists of a statement, which he constantly repeats in varying forms, to the effect that these statistics show that the conversion of the public and the profession to early operating has failed to check the increase of cancer. This is accompanied by implications that those in "authority," *i. e.*, those who have especially studied the subject, claim to the contrary. On these two points it seems to me that Dr. Little's assumptions are entirely unwarranted.

On the first point Dr. Little is definitely mistaken in his facts. In spite of the campaign of education which has been waged for a number of years, early operating is still, unfortunately, not the fact but the exception. The latest statistical analyses show that, on the average, cases still come to operation more than a year after the growth was first noticed and in many parts of the country the facts are far worse than this. Early operating is, as yet, so much the exception that it could not possibly have affected the general statistics.

On the second point, that experts claim it has so affected the death rate, Dr. Little's implications (he cautiously avoids direct statements) fail in accuracy. The general statistics of the country are so clearly unaffected that no one with any knowledge of the subject could possibly make such a claim. The campaign of education to which the American Society for the Control of Cancer and many public-spirited individuals in the profession have been for some years devoting themselves is now fairly well organized for prosecution over the country as a whole, but the inertia of conservatism is tremendous and, with all the work that has been done, it has so far been put into operation only in a few selected localities. Certain statisticians, notably Hoffman, have recently claimed analyses of *local* statistics hint that early operation has become more common and that the *local* death rate has improved in a few communities in which the campaign has been most active and longest continued, but these men themselves have stated that even these local decreases are suggestive rather than evidential. No one has claimed a *general* improvement over the country as a whole. Dr. Little states most truly that the whole voice of professional authority is committed to the belief that early operations, and especially the removal of pre-cancerous lesions, will, when generally adopted, decrease the general cancer death rate. Probably all of those who have consistently adopted this principle believe that it has already decreased this death rate in their own practice. From the nature of the disease statistical proof of the effects of early operating cannot be published till at least five years after the operation has been performed. From the nature of the case, such statistical proof in convincing mass has not, and cannot, yet be published, but Dr. Little perhaps forgets that the pronouncement of authority, of our masters, the leaders of the profession, has not been founded on theory, but on the results of their personal experience. To most of us such a consensus of opinion among our leaders as at present obtains must carry weight even while we wait for the definite statistical proof which they promise us. Dr. Little's statement to the contrary is, when analyzed, apparently a statement of his individual opinion.

I feel, Mr. Editor, that I must apologise for so lengthy a communication, but well written arguments upon unwarranted assumptions are sometimes capable of doing a great amount of harm.

EDWARD REYNOLDS, M.D.

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## RECENT DEATHS.

**DR. ELLIOTT DANIEL ROBBINS**, a Fellow of the Massachusetts Medical Society, and a graduate of Harvard Medical School, died at Boston, December 13, 1920, aged 64.

**DR. LESLIE H. HENDEE** died of heart disease at the age of fifty-six, on December 31, 1920, at Pittsfield, Massachusetts. Dr. Hendee was born in Lowville, N. Y. He was a graduate of the Baltimore Medical College in 1894, and began practising in Westfield. In 1905 he went to Pittsfield, where he organized the Emergency Hospital. Dr. Hendee was physician for tht Scottish Clans, Eagles, and Italian Societies, and was at one time president of the Pittsfield aerie of Eagles and Hampden County Medical Society. Dr. Hendee is survived by his widow and one daughter.

**DR. BENJAMIN SEAVER BLANCHARD** died at his home in Brookline, January 14, 1921, after a short illness from acute rheumatism. He was born in Roxbury, September 22, 1856, the son of William and Mary Elizabeth (Seaver) Blanchard, and was the grandson of Benjamin Seaver, who in the early fifties served two terms as mayor of Boston. He fitted for college at the Roxbury Latin School and was a graduate of Harvard with the class of 1879 and of the Harvard Medical School, 1882. While in college, Dr. Blanchard was prominent in sports and played halfback on the football team in the late seventies.

Following his course and graduation at the Medical School, he began practice and almost immediately took up his residence in Brookline where his active career in the profession had been passed and where he was widely known. He was a member of the Massachusetts Medical Society, The Country Club, Varsity Club, Unitarian Club and the Cohasset Golf Club and always kept up his interest in sports.

On November 30, 1887, he married Miss Clara Fessenden Barnes of Boston, by whom he is survived, together with three sons and a daughter.

The Boston Medical and Surgical Journal

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## New England Surgical Society

## THE INDUSTRIAL QUESTION: A PROPOSAL AND ANNOUNCEMENT.*

BY FREDERIC J. COTTON, M.D., BOSTON.

JUST a few things the war has taught us that should help forward our civil practice: the Carrel-Dakin treatment of septic wounds, the value of organized team work, the possibilities of the reconstruction idea.

The Dakin treatment we may leave aside, already safely ensconced in all the hospitals that really care about results.

My subject for today is that combination of reconstruction with the team work which alone can give it tangible results. Such a development, such a combination we had during the war—and with results, as you all know. In peace we have lost it!

Worst of all, I know of no civil hospital that has clearly seized the idea or even attempted the practical solution. Nor does it seem to me likely that any general community hospital is going to do it.

What we lack is what Governor Coolidge asked for in June, 1919,—care for civil cases such as the army wounded had.

The class of cases treated during the war were mainly battle cases; in peace we have the results of very varied accidents, mainly less serious, but the needed personnel, the general conception of treatment for return to function, the most favorable grouping of cases, are very nearly the same for accident cases as they were for the reconstruction work in the army.

Moreover, since we have had accident insurance laws in our states these cases form a definite class—potentially at least, a group as definite as the army cases.

It is with the army work in mind—the army work at its best—that I am going to give a brief sketch of the industrial surgical situation, based on an observation of some years and particularly in the eight years' life of our Massachusetts employers' liability law.

During these eight years I chance to have been surgeon to the City Hospital, chairman of the medical advisory committee of the accident board, and sometimes "impartial examiner" for the board and referee for certain insurers in the less happy cases—in whom late reconstruction work is to be considered.

All this means some acquaintance with results, particularly, of course,— the bad results.

They seem to leave a good deal to be desired and there seems to be an enormous economic and human waste involved in the total, because of faulty methods.

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* Read before the New England Surgical Association, Oct. 7, 1920.

Roughly speaking, the waste results from: lack of technique—and sepsis, mostly avoidable; lack of diagnosis of detail, particularly in fractures; inadequate primary surgery, particularly in fractures; in nerve and tendon injuries; lack of after-care, or routine after-care only; lack of coöperation of the patient; lack of review of cases that are "hanging along"; lack of knowledge of what can be done—late—by proper reconstructional surgery; lack of opportunity to get such work done; lack of means for bridging over the interval between technical cure and the power to do real work; lack of refitting of the handicapped to the old or to a new job.

Our cases are treated by their own doctors, or in general hospitals, and latterly many of them in clinics and hospitals run by insurance companies or in connection with factories.

Each of these methods at its best yields a good many good results—depending largely on the man who has the case. I am here speaking of averages only.

The least good average of results, I am afraid, comes from the hospitals, particularly the bigger ones, organized essentially for acute surgery, practising more particularly abdominal surgery, large enough so that much work falls to overworked and inexperienced juniors, so large that after-care is in too many hands with no one continuously in charge of the case. Moreover, these institutions all think they are charities—as a few of them are—and there is a feeling that industrial cases should pay their way nowadays,—as they should—that makes for lack of real interest in them. I am not very optimisite about developments in the larger institutions.

The smaller community hospitals do better, but there are few of them fully qualified for this work in equipment or personnel.

As to the private physician he does surprisingly well, all things considered. I don't see, quite, how he does it with his average disadvantages as to equipment and help. The answer is, I think, that he is vitally interested in the case in hand and does a bit better than his best.

Now as to company hospitals: they have one very great advantage, in that they are specialized for this work—just as the general hospital is not.

The clinic or hospital run by an insurance company may be very good—several of them are—but they are handicapped first, by a partisan attitude of their own workers; second, by lack of coöperation of their patients from a suspicion, usually not justified, as to the company's lack of interest in the case from the personal side. This, I am inclined to regard as serious enough to affect results appreciably.

Beyond this these clinics are usually swamped with routine cases, mainly minor, and a good many serious cases get by for a long time without needed review by really expert men.

The plant hospital is better off in all these respects, particularly in the matter of morale on both sides. In fact the best work that I know of has been done in hospitals of the larger plants affiliated with good local hospitals that take the more serious cases in.

The Fore River plant, the American Steel Wire in Worcester, the Norton File Co., the Waltham Watch Factory, all work on this basis.

This is the most hopeful type of organization, possessing as it does the advantage of close touch with the employee and his work and with a chance to do intelligent placement in convalescence much earlier than on any other plan, and an opportunity to do retraining and refitting when it is needed.

In New England unfortunately most plants are too small to carry a really adequate equipment and personnel.

What can be done to better the chances of the injured employee of a small concern or the man who wants his own doctor? I have for a good while advocated two things:

1. Systematic review of all cases on compensation over a few weeks to see what needs doing and whether it is being done.

2. An arrangement by which serious cases needing expert care can be referred easily, so as to get such care, whether they are under the care of their own doctor, or of the company doctor or the insurance company.

The proposition for a systematic review of all cases after six or eight weeks, has been put up to the accident board in Massachusetts as a substitute for the present system of not very valuable impartial examinations very late along in the course of contested cases.

There are legal and administrative difficulties at the moment, but I believe we shall get this in time if we continue to ask for it.

The second need is for a place and institution devoted, not to routine accident stuff, but to the problem of functional restoration in the individual referred case, whether this calls for sheer surgery or no surgery or medical care or combined treatment. That includes physiotherapy and some measure of occupational work.

I recognize that a lot of good work has been done by individual men along these lines on cases referred to them—I have done some myself.

What is needed is an institution to do this, big enough to have the services of the best experts in surgery and medicine in various branches, to have a team of skilled physiotherapy aides and technicians, adequate physical equipment, a proper record system.

This cannot be built in a day, but a beginning is being made. A charter has lately been issued to a corporation called the Reconstruction Association, to begin just this thing—with small beginnings, beginning small, to grow on merits, if it proves to have them, rather than to risk the entangling alliances likely if some man or corporation were to finance.

This corporation now stands ready to take cases calling for expert treatment along reconstruction lines at, practically, cost rates and give them the best treatment that can be offered; building up its force and its resources as it grows. In this plan a number of men and women who were in the war work are interested—the plan is for development along lines of the army reconstruction team work.

With the men associated in putting this thing through, ready to do the work without personal gain, there is going to be no financial or other difficulty in developing it, provided sufficient cases are furnished to get to work on.

We have never found insurers, as a rule, unwilling to pay for real results, and we believe savings from shortened periods of disability will be so obvious as to clear up the dollar question if the thing can only be gotten under way.

It is the same sort of thing half a dozen men have been doing in private and have found well worth while.

This is an attempt to make it non-personal, independent, non-partisan, to build it up to size enough to keep first class teams busy, and so to concentrate the work, reducing overhead charges per case in so doing, and to have a really efficient, specialized central institution body to which cases needing reconstruction treatment may be referred from whatever source.

If this works out there should cease to be any excuse for many of the results (or lack of results) that some of us have seen so often in the past, and a saving in human efficiency as well as an economic saving well worth while.

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# ACUTE INFECTIONS OF THE PANCREAS.

By F. B. Sweet, M.D., Springfield, Mass.

It is well for the surgeon to occasionally look behind him, take inventory and frankly review his professional experience. Such a survey of one's work on the one hand, exposes pitfalls and fallacies, to be in future avoided, and on the other, brings the cheerful realization that many an erstwhile insurmountable barrier was such by reason of tradition only. For, however much humiliation and disillusion the backward look may bring, one gains the compensating conviction that surgery is a forward looking calling, and its practitioners progressive men.

The surgical conquests of the past two decades in themselves, present an almost incredible record of achievement. Many remember the apprehension with which disease of the vermiform appendix was surgically attacked, to say nothing of such abdominal emergencies as ectopic gestation, biliary tract infection and perforation of the digestive tube. Year by year, one pathological entity after another has been sought out and controlled, until but comparatively few regions of the body remained unexplored and but few surgical diseases unattacked.

Let us briefly discuss one of the later triumphs: the surgical treatment of pancreatic infection. The anatomical relation and physiological importance of the pancreas, long prevented surgical interference. Its physiology was but indifferently understood and its proximity to important viscera and structures presented serious technical problems. Its blood, nerve and lymphatic supply is most generous and from several sources. It produces an external and an internal secretion. These facts explain why disease of the gland is complex in symptomatology and secondary to that of neighboring structures, particularly the gall-bladder. They also explain why the surgical treatment of its diseases presents so formidable a problem.

As a necessary foundation to the intelligent discussion of the subject of acute pancreatic infection, let us briefly review the very interesting studies made recently in the research laboratories of the University of Pennsylvania by Dr. J. E. Sweet.

These studies have greatly added to our knowledge of the pancreas and have been of aid in showing the reason for and a rational method of surgical attack. Sweet aptly says, "the manner of attacking any form of pancreatic disease is to be determined by a knowledge of certain of its physiological peculiarities."

As to the nature of the peculiarities, I cannot better convey the facts than by freely quoting from his recently published monograph.

1. "Pancreatic secretory activity is subject to dual control, namely through the nervous system, the rôle of which is not fully understood, and a more potent agent in the form of a chemical stimulant brought to the cells of the gland by the blood stream, from its place of origin in the intestinal mucosa. This substance called secretin, is formed by the action of hydrochloric acid upon a substance called prosecretin, contained in the cells of the mucosa of the duodenum and entire jejunum. When secretin is brought to the pancreas by the blood stream the pancreas immediately begins to secrete.

2. "The surgically important constituents of the pancreatic juice are the ferments trypsin and steapsin, the first, a proteolytic ferment and the second, a fat splitting agent. This latter gives a positive diagnostic sign in acute pancreatitis when the juice escapes into the peritoneal cavity where it comes in contact with fat and forms characteristic patches of fat necrosis seen in no other condition. While fat necrosis is the only infallible diagnostic sign, outside the pancreas itself, it is not always present. Trypsin is the all important agent to the surgeon, being that which determines operation and modifies treatment as will be seen later. This ferment is not contained as a ferment either in the gland cells or ducts, but is found as an inactive zymogen trypsinogen. This is the answer to the old question why the pancreas does not digest itself. The normal activating agent which transforms the harmless trypsinogen into the powerful ferment trypsin, is produced exclusively by the cells of the mucosa of the small intestine, and is called enterokinase. This body is only secreted when trypsinogen is brought into the lumen of the intestine. This enterokinase is the only substance normally present in the body, which can change trypsinogen into trypsin. An activating agent of similar, if not identical nature, is present in certain bacteria, and there is evidence that trypsinogen is also activated by some constituent of the pancreas itself, when it has been so injured as to become necrotic."

So much for the theoretical study of our subject,—now for the practical application of what has thus been learned, for after all, the cure of the patient is the ultimate goal of researchers and clinicians alike.

*First, the Diagnosis.*

Experience has taught us all that the symptoms of acute pancreatitis are those of upper abdominal peritonitis. They so closely simulate those of perforation of the gall-bladder, duodenum, stomach, high obstruction acute cholecystitis, that it is quite impossible to make a correct pre-operative diagnosis. In discussing the diagnosis, William Mayo catalogues the disease as an acute abdominal perforation, which in truth it is.

In the one or two cases, where I have personally made correct diagnoses, I have been prompted to guess aright by the extreme ill appearance and grave condition of the patient, rather than by intelligent reasoning. The finding of fat necrosis or free dirty or bloody fluid with palpable disease of the gland at operation, remains as ever the only sure method of diagnosis. Laboratory tests are unreliable. The almost constant association of gall-bladder disease in itself, hopelessly confuses the clinical picture. The difficulty of diagnosis and the profound illness of the patient, have always militated against prompt and bold treatment. In this condition, as perhaps in no other abdominal emergency, both diagnosis and successful treatment depend upon early operation and the provision of a means of exit, for both the infectious product and the deadly agent it has let loose.

The mortality statistics of promptly operated cases are most encouraging, and give reason for the hope that in the near future, acute pancreatitis will show as high percentage of recovery as do the more severe appendix infections In the neglected cases, the mortality is and will be appalling. The unoperated cases practically all die.

The surgical approach should be through either the gastro-hepatic or the gastro-colic omentum. Drainage material should be ample and well placed. The coincident gall bladder disease must be appropriately dealt with.

Pancreatic patients have a more or less stormy post-operative history. At best, attacks of epigastric distress and vomiting are not infrequent, and sometimes continue periodically for two or three weeks. The worst cases slough out part of the gland.

The functional margin of safety is undoubtedly great and is estimated by Sweet as two-thirds of the gland substance. In one of my cases it seemed as if most of the gland came away, but the patient suffered no ill effect.

The foregoing, with the following case reports, will I hope, stimulate discussion and help to convince the skeptical that acute pancreatitis, if diagnosed and treated early by operation, is not as hopeless a surgical condition as we have hitherto considered it.

The following six cases are all of true acute pancreatitis, of which I have personal recollection or records:

Mrs. S. Age, 40. 1913. Seen the second day of illness. Was then in semi-collapse. Great pain in upper abdomen, with tenderness and board-like rigidity in same region. No jaundice, but peculiar leaden pallor that I have since noticed in one or two other cases. She vomited frequently. Patient sent to hospital, but operation delayed two days because I lacked the courage to operate in her very ill condition.

The gall-bladder was found acutely inflamed and contained stones. There was widespread fat necrosis. There was gangrene about the head of the pancreas and bile poured out of Winslow's foramen. Gall-bladder was drained and large handkerchief wick carried down to neighborhood of pancreas head above duodenum. Lesser cavity not opened. Stormy recovery, repeated chills, septic temperature, vomiting and attacks of epigastric pain.

About three weeks after operation, as I entered ward one morning, I noticed a most stinking odor and was informed by an excited nurse that Mrs. S. had just flooded her dressings with pus. Investigation showed a very large portion of her pancreas lying beneath her dressings in a soapy, gangrenous mass. She thereupon made prompt recovery, but had pancreatic fistula for some months. This finally closed and she has since been well. This case illustrates a happy result in spite of neglect and late operation. It also lends weight to Mayo and Sweet's contention that the functional margin of safety of the gland is great.

Mrs. B. Age, 65 plus. 1912. Had been ill for several days with indefinite but severe upper abdominal symptoms. When admitted to hospital, was delirious and feeble. There was a tumor in the epigastrium. No jaundice. Exploration showed great omentum wadded about pylorus and duodenum. When disentangled, a small abscess in head of pancreas was found. There was a stone in the gall-bladder. No fat necrosis. A large wick was carried into abscess cavity. The gall-bladder was not opened.

She made a stormy recovery and was finally discharged to her home with a discharging sinus. Some time later, Dr. Birnie was sent in response to a hurry call and found her afloat in stinking pus and soapy necrotic portion of pancreas. She made prompt recovery. This case probably illustrates the type in which the ferment is not activated and infection results in abscess only.

Mr. C. Age, 55. 1918. Patient was a paralytic and in feeble health. First seen at his home suffering with symptoms of mild cholecystitis.

Because of his chronic invalidism and the apparent lack of urgency of his abdominal symptoms, I advised against operation. When brought to hospital three days later, he was very ill with symptoms of upper abdominal peritonitis. He was jaundiced. Operation revealed acute cholecystitis with stone and acute pancreatitis with abscess. There was general fat necrosis. Abscess opened and drained. Died on fifth day.

Mr. R. Age, 51. Admitted 1918. For several years had had indigestion and during last few months had suffered repeated attacks of upper abdominal pain accompanied by vomiting. Present attack came on twenty hours before admission. Similar to other attacks, but more severe and accompanied by chills. When admitted to hospital was in very severe epigastric pain with rigidity and tenderness over right upper quadrant. Operation 24 hours after onset of attack showed inflamed gall-bladder containing numerous stones, general fat necrosis of peritoneum, considerable quantity of bloody fluid in peritoneal cavity and very odematous and highly inflamed pancreas. Gall-bladder drained, lesser peritoneal cavity opened and large drain carried down to pancreas. His recovery was smooth and uneventful, being in my experience unusual in this respect. He left the hospital with a healed wound and in good general condition on the 28th day. Has remained well since.

Mr. K. Age, 30. 1918. Has had attacks suggestive of gall-stone colic for past two years. The morning of admission, was seized with violent upper abdominal pain, accompanied by vomiting, rigidity and tenderness. Had peculiar pallor. Was not jaundiced.

Operation the same day showed acute cholecystitis with several stones, acute oedema about head of pancreas and gall ducts,—fat necrosis not present but some bloody fluid in peritoneal cavity. When lesser cavity was opened pancreas was found acutely inflamed, but not necrotic. Gall-bladder and pancreas drained. Pre-operative diagnosis—perforated ulcer or acute pancreatitis. He made a good recovery except for the usual persistent epigastric pain. There was some digestion of the wound surfaces, but no sloughing of the pancreas. The only complication was a transient lymphangitis of chest wall during fifth week of convalescence. He left the hospital in six weeks with wound healed and has remained well since.

Mrs. D. Age, 29. 1919. For past eight weeks, had attacks of severe pain in epigastrium, attacks lasting from six to twelve hours. They occurred about once in three days and required morphine for relief. Had a baby ten weeks old. Was jaundiced and said she had been since the birth of her child. Her symptoms were very indefinite the first day, but on the second, the jaundice became marked. Pain was constant and severe, with sharp upper rectus spasm and acute tenderness. Operation on the second day. Gall-bladder acutely inflamed. Many stones, free fluid, fat necrosis in region of pancreas, but not widespread. Pancreas odematous with gangrenous and hemorrhagic areas. Gall-bladder drained, lesser cavity was opened, gland broken into and large wick drain introduced. Her recovery was good, although on the 16th day her temperature rose and she suffered epigastric pain and vomited. There was no sloughing of pancreas. She remains well.

These cases are too few for statistical purposes, but certain interesting facts may be noted for what they are worth. All stressed epigastric pain; four of the six had fat necrosis; three had bloody or dirty fluid; two were jaundiced; three had leaden pallor; two only gave history of radiation of pain to right shoulder blade, a curious fact when we remember that all had definite gall-bladder disease with stone; all showed unmistakable gross change in pancreas; the three cases operated early made good if somewhat stormy recoveries; the three operated late, yielded one death and two prolonged and septic illnesses with recovery only after a considerable portion of the gland substance had sloughed away.

## OBSERVATIONS ON SOME CASES OF PERINEAL PROSTATECTOMY.

By J. Dellinger Barney, M.D., F.A.C.S., Boston.

*Chief, Genito-Urinary Service, Massachusetts General Hospital.*

Although it is probable that a careful inquiry among urologists would show that the perineal operation for prostatectomy is largely taboo, there is no question but what it has its advocates. Experience is the best teacher and one should approach any question with an open mind. It was in this spirit that I became interested in perineal prostatectomy some years ago, and when my friend, Dr. F. G. Balch, sung its virtues so gracefully in his paper before the Boston Surgical Society in 1915 I was still further encouraged to acquire a first hand knowledge of the operation.

This paper is the study of a small series of cases, 34 in all, of perineal prostatectomy done by me since 1912. Owing to inadequate or unobtainable data I have not included, except under general impressions, several others which I have done. But these comparatively few cases have been sufficient to give me a fair picture of the operation and to bring out some of its possibilities and disadvantages. Although several of these cases proved to be cancerous, none was approached in the knowledge that this disease existed. They were taken at random among my patients as they presented themselves, all my other prostatectomies being operated by the suprapubic route, for the most part, in two stages.

My youngest patient was 41, the oldest 78, the average age being a little over 65 years. Their general condition was recorded as "good" in 21, "fair" in 6, distinctly "bad" in 7. The blood pressure varied greatly but was found to average just below 150 mm. systolic and just under 90 mm. diastolic.

Symptoms of prostatism had begun anywhere from a few months to 15 years before the patient sought relief. In eight the annoyance of one or two attacks of acute retention of urine brought them to a decision; on the other hand 13 had had more or less complete retention, and had derived greater or less comfort from the catheter for weeks, months, and in some cases, years, before deciding that there must be some better way out. In 20 cases there was marked frequency, both by day and by night; nine gave a definite history of hematuria. The urine was practically clear and contained but small amounts of albumen, leucocytes, blood cells and bacteria in 13 cases; in eight, the urine was in "fair" condition, while 11 patients passed a thick, foul ropy urine. Where the patient was not found to have complete retention with an over distended bladder (4 cases), the residual urine varied from two to twenty ounces, the majority having four or five ounces.

Rectal examination brought out some interesting points. In 23 the prostate was described as smooth, elastic and enlarged, the hypertrophy being well marked in some instances, and involving one or both lateral lobes. Judged by this standard alone none of these patients had cancer, yet in four of them, examination of the prostate by the pathologist or subsequent events showed that cancer was present. On the other hand, rectal examination of six cases showed a firm, more or less nodular prostate strongly suggestive of cancer, yet in two of these the pathologist and careful post-operative observation showed that my finger had erred in the other direction. It, therefore, follows that one cannot always eliminate the possibility of cancer in an apparently innocent feeling gland nor, unless the disease is well advanced and unmistakable, can one be sure he is dealing with cancer.

Cystoscopic examination of the bladder before operation was done in but 11 instances. In nine of these, definite and valuable information was obtained as regards the presence of diverticulum, stone, a large median lobe, or appearances suggesting malignancy. In at least two cases, subsequent events made me regret that this examination had not been performed. I, therefore, do not hesitate to state that if one is to do perineal prostatectomy, cystoscopy should always be done. It may add one more burden to the patient's load, but the information thus gained may be well worth while.

Preliminary catheter drainage was instituted in 24 patients. In four others the catheter could not be tolerated or could not be made to drain well after a few days. In these cases suprapubic cystotomy under local novocain anesthesia was performed, and kept up till the patient was in satisfactory condition. Drainage by this method alone was resorted to in one case. In none, did the opening of the bladder above complicate the subsequent perineal enucleation or the convalescence. Indeed after the removal of the prostate, and the establishment of free perineal drainage the suprapubic wound healed with the greatest speed and nicety. I, none the less, consider that if one is obliged to resort to suprapubic drainage it would be wiser to complete the operation through this wound as a two-stage affair, rather than plunge into fresh tissue a second time and in another situation.

While in four cases no drainage at all was carried out (these being early cases, with little or no residual and a repeatedly high function) this procedure lasted on an average of eleven days. Many were so treated for three to four weeks, and I believe, to their great advantage. The phenolsulphonephthalein test was relied upon as the best all-round guide to the *status quo*, although the old-fashioned, but still reliable clinical methods of estimating a patient's condition were by no means neglected. The functional test varied widely, both before and after drainage. The average for the series at the time of operation was 51% plus, the lowest being 15%, the highest between 80 and 100%.

Prostatectomy was performed under spinal anesthesia alone, in 21 cases. In all of these novocain (Tablet C) was used, there being no pain or even discomfort at any time during the operation. In five more cases this anesthetic was entirely successful until the final enucleation of an adherent lobe was reached and at this stage of the proceedings a few whiffs of ether (hardly enough to produce primary anesthesia) were given. In three other cases, for reasons as yet unexplained, the novocain produced no effect whatever. As spinal anesthesia is severely frowned upon by a number of surgeons, and in some localities is never used on account of its supposed dangers or evil results, it may be well to state that these 28 patients having spinal anesthesia showed no ill effects whatever from it. In most, it was administered by me, the rest being done by an anesthetist or by my assistant. Although it is not uncommon to find a more or less marked fall in blood pressure after spinal anesthesia, resulting sometimes in a definite and alarming symptom-complex, this phenomenon was not noted in this series. In one patient who averaged about 150 mm. before operation, the pressure rose to 210 mm. immediately before the anesthetic was given. After operation his blood pressure was again 150 mm. Another whose pressure was 155 mm. before, registered 135 mm. after operation. In the four or five other patients whose pressure was taken immediately after operation there was a correspondingly small drop. I think that this may be explained by the fact that the total volume of fluid injected into the spinal canal was small, never over 3 c.c., was never injected higher than the third lumbar interspace, and was always injected very slowly. The drug was thus diffused but a short distance into the spinal canal, not high enough to effect the splanchnic nerve plexus. While this technique may account for the insignificant changes in blood pressure after operation, it may also have been responsible for the incomplete anesthesia found in eight cases. Although I deplore the use of ether for prostatectomy it was used in four cases, the much safer gas-oxygen being employed twice.

My notes as to the findings at operation show some points of interest. The prostate was nonadherent and was shelled out with the utmost ease in 12 cases, all of these proving to be benign growths. Enucleation was equally easy and the report equally favorable in one which later turned out to be cancerous. Thirteen prostates are recorded as having been adherent and enucleated in some cases at least with much difficulty. Five of these were shown to be cancerous, but in eight instances the gland was benign. It, therefore, does not follow that adherence of the gland to its surroundings is a sure sign of cancer. It is remarkable that there was a total of six cases of cancer in this series, nearly one in six, a percentage of 18.8.

In my earlier cases the perineal incision was of the inverted U type, but latterly I have used a simple straight vertical incision with more satisfactory results. The apex of the U in the former incision does not heal quickly, or approximate itself to the rest of the wound; the straight incision gives all the room necessary, and its edges come together readily, leaving a small linear scar. Secondly, in my experience, the removal of stones, even up to the size of a pullet's egg, through the perineum, has been easily accomplished with the old-fashioned lithotomy forceps, or with a lithotrite, this procedure being generally carried out after enucleating the prostate. Thirdly, I have not yet encountered a prostate so large that it would not emerge through the wound after a little manipulation, nor have I yet been harassed by losing a loose lateral or median lobe in the bladder. My finger has been able to reach well into the bladder and to palpate readily the entire edge of the prostatic capsule after the enucleation.

I have always regarded the perineal operation as especially desirable because of its comparative freedom from hemorrhage. The records of 30 of my cases show that the bleeding during and just after operation was insignificant. In three others enucleation of the prostate was attended by sharp hemorrhage not ceasing spontaneously, and necessitating control. One was stopped by a single gauze pack; the other two were quickly and completely controlled by the Hagner bag. This was inserted deflated and bulb first into the bladder through the perineal wound. The bag was then inflated and downward traction made on the tube, the result being that the torn edges of mucosa were firmly and smoothly pressed against the sides of the prostatic cavity. In one case the bag was deflated about six hours after operation and removed next morning; in the other the bag was by accident left in place, fully inflated, for about 24 hours, yet the patient urinated freely and comfortably around it. While I find myself using this bag less and less in the suprapubic operation, it is a most efficient and certain method of controlling hemorrhage in the perineal operations. Packing a perineal wound with gauze is difficult and often futile for the reason, that the tighter one packs the gauze against the bleeding bladder neck, the more one pushes it upward, and the more one tears up the mucosa of the empty prostatic cavity.

Ordinarily a large single or two-way rubber tube was inserted into the bladder after the enucleation of the gland. This has been found to give ample drainage, not only to the bladder but to the prostatic cavity and the wound. The two rubber-tissue wicks, one on either side of the drainage tube, which I once used as a routine, have long since been omitted without ill effects. Indeed, I have often been tempted to omit even the tube in the belief that drainage would be adequate without it. Tubes and wicks have always been removed within 48 hours, more often on the morning of the day after operation. Complete incontinence usually ceased within three to five days after operation, the urine being then passed at short intervals through the perineal wound. Most patients began to urinate a greater or less amount through the penis in about a week, the perineal leakage continuing for ten days to two weeks longer, or until the wound healed.

There were no post-operative complications whatever, in 16 cases. In an equal number the convalescence was interrupted by some untoward incident. The most important was post-operative hemorrhage which occurred in four patients on the eleventh, tenth and eighth days, in three, and continued off and on for nine days after operation, in one. In two, it eventually stopped spontaneously; in the other two, a light gauze pack was required. In four other patients epididymitis (bilateral in one) intervened. The perineal wound closed down in two cases, producing retention of urine and eventually requiring suprapubic cystotomy. In both of these the prostate was malignant. Phlebitis, pneumonia, prevesical abscess, bronchitis, hemiplegia, chills and uremia, seven different complications, attacked nine other patients. A perineal sinus persisted for several weeks in one patient, largely owing to inadequate treatment in the institution where he was; in another, a sinus persisted off and on for nearly a year in spite of the best care I could give it.

There were three operative deaths, a mortality of 8.8%. One, a feeble old man, succumbed to the effects of a secondary hemorrhage occurring 48 hours after operation; another, equally old and feeble, gradually failed and died in the hospital several weeks later apparently of cardio-renal disease; the third died in uremic coma three or four days after operation, in spite of the fact that his phthalein test was 80% on two occasions and he was regarded as a very good risk.

My belief is that a successful operation for prostatectomy should result, first, in a live patient; second, in free and infrequent urination; third, in little or no residual urine, and fourth, in a restoration of health and comfort so far as the patient's age will permit. I have already stated that three patients died shortly after operation. The condition of 21 others from several months to several years after operation has been ascertained. Eleven of these fulfilled the conditions just named and are unquestionably brilliant results. The paths of ten others have been somewhat rough, even stony.

One proved to have a cancer of the prostate in spite of a "benign" report and was put on a catheter life with a suprapubic operation later.

One has never regained complete control, has to wear a rubber urinal day and night, and has a residual of one ounce.

Another went along well for a time until the suprapubic wound, through which his pre-operative drainage took place, broke open and required several rounds of catheter drainage to close it.

One developed a large vesical calculus nine months after operation, submitted to litholapaxy, made a good recovery, and now is contented and happy.

One individual never fully recovered from operation, had increasing difficulty of micturition with hematuria, accepted the proposition of a suprapubic operation and was found to have extensive cancerous involvement of his bladder neck. The pathologist had reported a benign prostate.

A perineal fistula opened and closed for nearly a year in one patient, who in addition to this, developed epididymitis with abscess of the scrotum requiring drainage. Careful and frequent dilatation of the urethra closed the fistula, but there is a tendency to stricture at the bladder neck and a residual of two ounces.

One patient has subsequently died of cancer involving the entire bladder. He was one who was not, but who ought to have been, cystoscoped before operation. In this case also the prostate was reported as benign.

Although in good general condition another patient had not regained much control several months after operation, but thought he was gaining.

Still another patient developed increasing frequency and dysuria some months after operation. He was found to have a bladder stone and litholapaxy was successfully performed. He led a reasonably comfortable existence for some months more and then died.

Finally one poor fellow has developed melancholia which grows no better with the flight of time. In addition to this he has had several attacks of epididymitis, has at least four ounces of residual urine and what amounts to stricture at the bladder neck.

Having now recited in perhaps fatiguing detail my experiences with perineal prostatectomy, you may ask what I think about the operation. My answer is, that when successful it is a huge success, but one cannot be as certain of the outcome as with the suprapubic operation. The technical difficulties are considerable and it is absolutely essential to know the anatomy of the perineum, a requirement which cannot always be fulfilled. Another essential is that cystoscopy should always be done lest a tumor, stone or diverticulum be overlooked. Here again there are many who can operate but who cannot use the cystoscope. It seems to me that these are two strong arguments against the general employment of this type of operation. The mortality has certainly been small, but the number of unsatisfactory post-operative results has been too great to satisfy me. The untoward post-operative results are largely due to lack of control, tendency to stricture of the bladder neck and inability to empty the bladder completely. Injury to the rectum has not been a factor, nor has a persistent perineal fistula been an item of any consequence. On the whole I think there is no question but what in the majority of cases the two-stage suprapubic operation is the best and safest procedure.

# A CASE OF OVARIAN PREGNANCY.

By Michael F. Fallon, M.D., Worcester, Mass.

The occurrence of ovarian pregnancy is so rare that I should not have the temerity to report the following case were it not for the authoritative pathological diagnosis by Dr. Howard T. Karsner, formerly of the pathological department of the Harvard Medical School, now professor of pathology at Lakeside Hospital, Western Reserve University School of Medicine Cleveland, Ohio.

Ovarian pregnancy was recognized in 1614 by Mercerus; but even as late as the nineteenth century, authorities differed as to the possibility of its occurrence,—the English school denying its possibility, while the Germans almost universally admitted its possibility. Confusion may easily occur in the diagnosis, and the judgment of true ovarian pregnancy should rest with the trained pathologist.

The difficulty in the diagnosis, however, is not so great where the pregnancy is prior to the sixth or eighth week, such as is our case; since, in such cases, the relation of the fetal tissues within the ovarian substance can be definitely outlined, and, indeed, the majority of authenticated cases have been those where the pregnancy has been of less than six weeks' development.

The criteria by which ovarian pregnancy is established were formulated by Spiegelberg in 1878, and these criteria are now generally accepted. They are: (1) that the tube on the affected side be intact; (2) that the fetal sac occupy the position of the ovary; (3) that it be connected with the uterus by the ovarian ligament; (4) that definite ovarian tissue be found in its wall.

Norris, in a study of the literature of ovarian pregnancy for a period of ten years, found 19 positive cases.

Williams, of Johns Hopkins University, in a searching examination of reported cases up to 1906, found thirteen cases positive, seventeen cases highly probable, and five cases probable; and he noted that of these thirty-five cases, in eleven, the pregnancy went on to full term, and in not a few instances gave rise to lithopedian formations. And he and other authorities concluded that the ovary can accommodate itself more readily than the tube to the growing pregnancy.

Rupture, at an early period, is the rule. The symptoms of ovarian pregnancy are essentially the same as those of tubal pregnancy, *i.e.*, the missed period and then irregular uterine flowing, at times accompanied with cramp-like pains; the pains, however, are not severe unless rupture takes place.

When rupture does take place, the symptoms are likewise similar to those of ruptured tubal pregnancy, *i.e.*, sudden sharp pain with collapse.

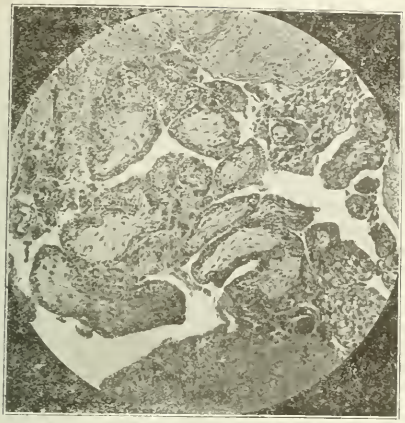
Th ovary from anatomical reasons, permits of a greater expansion than the tube, and thus gives opportunity for a longer development of the fetus; and when the rupture takes place, the bleeding from the ovary is apt to be greater than that from a ruptured tube, since the avary has a richer blood supply.

From a study of animals and human beings, it is now universally accepted that the union of the spermatozoon and the ovum takes place normally either at the fimbriated extremity of the tube or upon the surface of the ovary; hence, in its incipiency, pregnancy normally is extra-uterine.

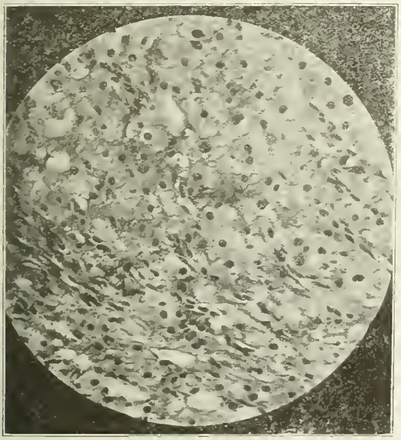
Ovarian pregnancy results from the uniting of the spermatozoon and the ovum in the graafian follicle, and the further development within ovarian substance.

## HISTORY OF CASE.

Mrs. P., aged 30, multipara, last confinement six months before operation. Since confinement, menstruated irregularly, but for a few weeks previous to operation had frequent slight flowing spells and indefinite abdominal pains.



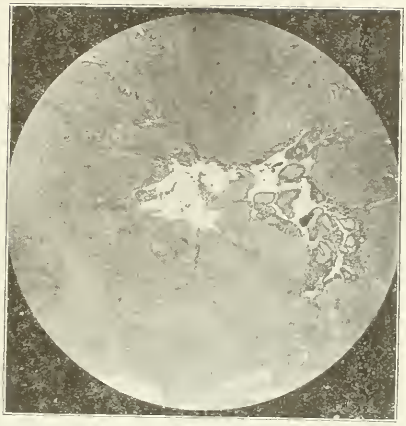
High Power Magnification of the Chorionic Villi Lying in a Mass of Blood Clot.



High Magnification of the Large Mononuclear Cells of the Corpus Luteum, Showing at One Side the Ingrowing Connective Tissue Cells.

Operation, May 18, 1914, by Drs. Fallon and William F. Lynch.

On opening the abdomen a quantity of blood was seen in the pelvis and a tubal pregnancy looked for, but both tubes and both fimbriated extremities were normal. On the surface of the right ovary was a small bleeding cyst filled with blood clot There was a constant dripping of blood from this cyst. This cyst, with the surrounding ovarian tissue, was excised and sent to Dr. Karsner of the pathological department of the Harvard Medical School. (The abdominal pains, by reason of which the patient was sent to the hospital, could have been due to either a pathological appendix or to gall-stones,



Low Power Magnification of a Field Showing at One Side the Chorionic Villi and at the Opposite Side the Tissue of the Corpus Luteum. Most of the Tissue is Lutean, the Blood Clot only Appearing Between the Villi and the Margin of the Photograph.

or to both, but at the time of operation, a lower abdominal median incision was made in the belief that the lesion was extra-uterine pregnancy. (The patient at this time refused operation for gall-stones, but four years later we operated for gall-stones, and took occasion to examine the resected ovary. Here was a small nob on the surface showing the site of the previous resection.)

Dr. Karsner kindly sent us photographs showing chorionic material surrounded on all sides by lutean tissue. Here follows Dr. Karsner's description of the specimen:

Histologically, specimen is found to be a corpus luteum with only a small rim of ovarian tissue on one side. It measures 20 x 5 mm. The outer margin of the corpus luteum shows a slight ingrowth of connective tissue. Centrally, there are large masses of blood clot, showing fibrin, erythrocytes and leukocytes. Embedded in the clot and in several places practically in apposition to lutean cells are numerous sections of chorionic villi, showing the usual central arrangement of connective tissue cells with intervening paramucin surrounded by a single or multiple layer of small cuboidal cells. In connection with the cuboidal cells are frequent larg multinucleated suncitial masses.

A comprehensive study of the specimen shows this chorionic material to be surrounded on all sides by the lutean tissue. The diagnosis is therefore pregnancy *in corpus luteum.*

(Signed) Howard T. Karsner.

### DISCUSSION OF DR. COTTON'S PAPER.

**Dr. Seldom B. Overlock**, Pomfret, Conn.: I was glad to hear Dr. Cotton speak of the work of the smaller hospitals, and in the smaller hospitals the whole secret of the thing, as far as I know, is that the surgeon has taken care of the case himself as he takes care of the private patient. The great difficulty in our State, when the act came in eight or ten years ago, was the fact that the patient wanted his own physician to take care of him. Later, in many instances, these patients who had been taken care of at home presented themselves at a hospital with septic wounds or some mal-function due, for example, to an unrecognized severed tendon or badly adjusted fracture. This is in great measure being overcome by the experience of the injured person himself. He has learned that he receives better care and secures better results by entering a hospital immediately after he has received his injury. He makes this fact known to his fellow employees and this results in more and more of them entering hospital as soon as injured.

**Dr. Ernest A. Wells**, Hartford: I would like to ask Dr. Cotton what impelling force he expects to find to separate the patient from his physician and get him into such an institution as he describes. We know that the institution will frequently take better care of the man than his private doctor. But in many instances the very fact of defective treatment and a slow or poor result has become a source of increased revenue to the doctor.

**Dr. F. J. Cotton**, Boston (closing): In regard to Dr. Wells' question, I think that in the long run, the force is the intelligence of the man who is being treated. The fact that the patient is free to go ahead with his own doctor is not a great handicap since the war. The patient is perfectly ready to change his treatment at the suggestion of an insurance company who want to send him somewhere, if he is convinced that the treatment he is going to get is real and that it gives him some prospect of better results, and that he is being fairly treated. The patient in a great many instances feels that the insurance company isn't treating him fairly. So we are coming forward with this proposition not to make it a partisan problem. The injured man thinks that the insurance company does not care about him, and if he can be assured that he is going to be taken care of, that the insurance company is trying to do something for him, then I think there will be no trouble. The one catch that remains is in digging out these cases, and that is the proposition I had in mind for a routine review. If these cases are reviewed and the matter is reported to an accident board, then it is reasonable that the cases are going to be straightened out. The trouble is that these cases go along for months and months, and the only way now in our State is for an intelligent insurance man to keep track of these cases and turn them over to private men for private work, and they will get the case over if they know that it isn't being properly handled. In the meantime I think it is up to the insurers, the "carriers" to adjust that. I think that the difficulty is more apparent than real if you have something to offer.

### DISCUSSION OF DR. SMITH'S PAPER.

**Dr. D. F. Jones**, Boston: We have all been in the habit of considering all lesions of the pancreas under one variety, that is, acute hemorrhagic pancreatitis, an acute abdominal condition in which we find bloody fluid, fat necrosis and varying amounts of blood about the pancreas. The patient is operated upon and the outcome is fatal in a large percentage, 50% to 75% of the cases. That there are all grades of acute pancreatitis, from small areas of congestion or oedema, to apoplexy or gangrene of the pancreas, and of chronic pancreatitis from simple thickening of a large or small part, to abscess formation, is rarely thought of.

The prognosis in the acute cases would seem to be almost determined by the amount of blood about the pancreas. Many of the milder cases recover with operation, and I am convinced that many cases are not operated upon at all.

The chronic cases, including the abscesses, recover in a large proportion of cases. The acute cases should be operated upon and the area about the pancreas drained early, because this is the only possible hope for many of them.

Dr. Sweet reported several cases of abscess of the pancreas, and there are more of them, I believe, than is generally supposed. The prognosis in these cases is excellent. It will be seen, therefore, that the prognosis in pancreatitis should not be considered under one head.

In regard to the amount of the gland that is necessary to life, I have one interesting case which was operated upon at the Massachusetts General Hospital some five years ago. He had acute hemorrhagic pancreatitis, his lesser peritoneal cavity was opened, the gland itself was opened by separating the lobules of the gland with the finger. The man made a fairly good recovery with sloughing off of what appeared to be the whole body of the pancreas. Of course, it was not, but it was a large piece of the pancreas. He has had, since that time, what appears to be a pancreatic fistula which has been discharging about four ounces a day ever since, and in spite of this he is in perfect health and his digestion good. He has no symptoms of diabetes at the present time. It is evident from this case that the margin of safety must be very large.

These cases are very interesting and diagnosis is difficult. I know that up to within a few years I had never seen a case where a correct diagnosis had been made. The usual diagnosis has been intestinal obstruction in the great majority of cases I have seen. With surgeons who take the trouble to go at it very carefully and thoroughly nowadays, I think the diagnosis can be made much more frequently. I also believe that many cases diagnosticated as attacks of gall stones are really attacks of pancreatitis.

Dr. R. B. Greenough, Boston: I can bear out what Dr. Jones has said in regard to cases of pancreatitis of the milder type, which may cause alarming symptoms but some of which, at least, recover without operation. I believe, myself, that mild degrees of acute pancreatitis are not uncommon. I have in mind a patient on whom I operated some years ago for symptoms of acute intestinal obstruction and distention of the upper half of the abdomen. There was, I found, no mechanical obstruction, but there was some bloody fluid in the peritoneum, and a few spots of fat necrosis which directed attention to the pancreas. The pancreas was slightly enlarged, but I found no area which I thought it legitimate to open into and drain. I closed the abdomen, and the patient made a satisfactory recovery. This case would undoubtedly have recovered without operation. As a matter of fact, however, the diagnosis being so uncertain, I believe symptoms such as the above demand an exploratory operation, and under similar circumstances, I would operate again.

Dr. Lyman Allen, Burlington, Vt.: I think Dr. Greenough was pretty lucky with that case. I want to report one I saw a year ago in which the symptoms were those of a ruptured gastric or duodenal ulcer. The case, a woman of 45, was operated upon twelve hours after the onset of symptoms. There was no history of previous digestive trouble. There were no gallstones, no inflammation of the gall-bladder, and no gastric ulcer; the head of the pancreas was of a dark chocolate color; there was no abscess; small spots of fat necrosis were all over the belly and omentum, and there was free, cloudy fluid in the abdomen. In that case I drained from the region of the head of the pancreas, and then in spite of the fact that the gall-bladder appeared healthy, I drained the gall-bladder, thinking that in that way I should be draining the pancreatic duct. That case made a recovery, operated upon after a delay of twelve hours. Those acute cases ought to be operated upon early, for the symptoms are those of an acute abdominal lesion, which demands immediate surgical intervention. This case was also interesting because within three months she developed a stricture of the esophagus which I thought at first was entirely reflex, but which apparently is not. She has refused any operation, but for a time allowed the occasional passage of a bougie, which she refuses now. I have not seen her for six months. She is well and is doing her own work. As long as she restricts her diet to semi-solids and liquids, she gets along well.

Dr. Alfred M. Rowley, Hartford: Dr. Sweet spoke about one diagnostic point—pallor of the patient. These patients are in a state of shock and have an upper abdominal lesion, and I think we can go one step further and say that there is not only pallor but there may be cyanosis and dyspnoea. This is seldom present in other upper abdominal lesions.

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Dr. Robert B. Greenough, Boston, presented a paper on "Radium and X-ray in Treatment of Cancer."

Dr. Arthur T. Jones, Providence: I have not prepared a paper. Being on the program with Drs. Greenough and Simmons, I know that you will get the real information from a scientific standpoint which you want, from them. Still I felt that possibly a few remarks from me from the viewpoint of the average man who is seeing these cases each day or each week, might be of some value. I think we all see a certain number of cases that are inoperable, we feel, from a surgical standpoint; and those are the cases which we are inclined to turn over to radiation, either x-ray or radium treatment. Personally, I have felt that a case which was surgically operable I did not feel like turning over to radium treatment. Now these men who are capable of forming their opinions, I wish would set us right on that point. Are there certain lesions which it would be better to treat primarily by radiation rather than to attempt surgery primarily, or shall we treat these cases surgically and follow that treatment up with our radiation? I have not felt quite sure on those points. In the cases I have had,—most of them, as I say, inoperable—the results have not been very satisfactory. I have tabulated just a few cases, of which I want to give you the data briefly, which I think are typical of the work we get. Those cases are treated either here in town by our competent radiographer, Dr. Gerber, or we send them to Boston, to the Huntington Memorial. Some cases have been very satisfactory, but the majority of them have been unsatisfactory. Dr. Greenough and Dr. Simmons will probably tell us why—whether those cases have gone too long or whether that is the present status of the treatment and whether we cannot hope for anything more than we are getting at present.

I want to note these cases: The first case that came to me had a hysterectomy eleven years ago by Dr. Cushing in Boston. She had a malignant condition in the vaginal vault following the operation, and radium was applied the 15th of June of this year, and that patient is improving.

The second case, malignant tumor of the cheek and lower jaw, was operated upon and had a recurrence; radium was applied in May of this year. The patient died in September. No apparent improvement from radium treatment.

The third case, a woman, 41 years old, with recurring cancer of the breast: radium treatment in March. The patient died in August.

Next case, woman, 60 years old, with recurring cancer of the breast following operation. Radium applied in March; her condition as present is improving.

The next case is rather interesting and one of the few cases I have had which have given a satisfactory result. This woman was 41 years old, a widow, sent to me with enormous great cancer of the cervix—one of those great big ones you can sweep your hand around, suspended in the vagina, and with a pelvis full of cancerous disease. I refused operation on her and said her only hope was radium treatment. Dr. Gerber treated her with radium, and her condition cleared up marvelously. It was one of those cases that worked like magic. Her vaginal vault is free from any cancerous disease, the uterus feels really larger than normal; it is fairly movable, and the condition is so good that I wondered whether we could do a hysterectomy on her now. On receiving advice not to, we have left that woman as she is, and recently without our knowledge or consent she has married again. But her case has been satisfactory from the standpoint of clearing-up symptoms. I feel that she is going to have a recurrence and eventually die of cancer: but the point is, should we in a case of that sort operate after our radiation, and will Dr. Greenough and Dr. Simmons tell us when we shall operate? Some of the men may operate shortly, within two or three days after the application of your radium; if you do not, then the operation will be exceedingly hard, and is it going to be as successful as early operation?

Another case: recurring cancer following panhysterectomy. Radium was applied in October, 1919, one year ago; her present condition is unsatisfactory and she has a very large mass in the pelvis pressing on the rectum and on the bladder, and her condition is getting at present, rather miserable and life is almost unbearable for her. She is still living and was in my office the other day.

The next case, 50 years of age, inoperable cancer in which we used the *Percy* cautery, recurrence following. radium was used in February of this year. Apparently no result. She died in June.

Next case, a woman, 71 years old, with a growth on the forehead, epithelioma, rather extensive, that was removed and recurred. She had radiation, and it looked as though we were going to get no result—that it was going to continue to recur. The recent report from her is that it is improving; it is clearing up and it looks rather satisfactory. Evidently the fright we got was from the effect of the radiation rather than from the effect of the growth.

The following case (that was a recurring cancer of the breast in a woman of 45 years, by the way), in a small area which resisted healing and was very persistent. Radium was applied in June and her condition has entirely healed.

The last case, aged 63 years, cancer of the uterus, which was treated by Dr. Pfahler of Philadelphia, came under my observation this summer. Her history shows that it was one of those extensive inoperable cases. Dr. Pfahler gave her radium and she came to me with a rather satisfactory condition. The vaginal vault was clean but showing an area which seemed to show that the effect of the radiation had not subsided. There was a mass in the pelvis, and I advised further radiation, which was done by Dr. Gerber. She has not responded to the second radiation and her condition at present is rather bad.

There are those ten cases which, it seems to me, illustrate fairly well the experience which the average man is having with these cases. And I feel it is up to these men who are doing this thing scientifically to give us the best they can for practical use and all the points they can, and that they should tell us which case, from their experience, will respond and which case will not respond. I think it will be of decided advantage to us if they will give us the practical points which a great many of us need in these cases.

Dr. Arthur L. Chute, Boston: I have been interested in the last few years in the use of radium and its emanations on cancers of the bladder and prostate. The actual work has, for the most part, been done by my associate, Dr. G. G. Smith. I have an impression that the patients derive a considerable benefit from its use, but I think I can only say that it is an impression rather than a definite conviction, because it is so tremendously hard to standardize the malignancy of these tumors and to know what would have happened if one had not used radium. For instance, I met on a train about four months ago a patient upon whom we used radium emanations two and one-half years before; this patient had a most unpromising cancer of the bladder which was removed surgically and upon which radium emanations were used twice; the patient was apparently perfectly well when I saw him. On the other hand, we treated recently another similar case into which we put 25 milligrams of radium and left it for twenty-four hours, and yet recurrence took place almost immediately.

Last winter I had a report from a patient from whose bladder I removed a malignant mass as large as a silver dollar eight years ago. This mass involved the region of one ureter and after excising it I had to reimplant the ureter; the patient was well eight years after operation.

Again I have heard, within a few days, of a patient from whom I removed, eight years ago, a prostate that was both clinically and microscopically carcinoma. This man remains well. Cases like the above make it desperately difficult to measure accurately the value of the use of radium in malignant disease. I have a distinct impression, however, that it is helpful in these cases.

Dr. R. B. Greenough, Boston: We have now had radium sufficient to try it out in the treatment of malignant disease for about eight years, and although the material upon which it could be tried was frankly the most unfavorable material—inoperable cases and cases recurrent after operation—we have learned certain things about it, and we have come to appreciate that radium has added wonderfully to our resources in the treatment of malignant disease. There are some questions, however, which still remain unanswered, and among these I would put, first, the question of the advisability of substituting treatment with radium in place of operative treatment in some cases of cancer of certain organs. The first operations done for cancer of the lip were restricted to the V excision. As a result of these operations, only those cases of cancer of the lip were cured which were operated upon so early that metastatic involvement of the regional lymphatics had not yet taken place. For this reason the radical operation was extended by the addition of the neck dissection on one or both sides. With the more extensive operation a greater number of successful cases was obtained, and microscopic examination of the removed lymphatics showed, repeatedly, that early cancerous involvement of the regional lymph nodes was no bar to a radical cure of the disease.

In general, radical operations for the cure of cancer are based upon these facts, and in many other situations the radical or "complete" operation is performed, and patients are cured of cancer even when it has extended beyond its point of origin. For this reason the treatment of cancer of the lip by radium must be regarded as a step backward to the time of the early and incomplete operations for the cure of this disease. In fact, the radium treatment of operable cases of cancer of the lip is not countenanced in the best clinics.

When we come to cancer of the cervix, conditions are not quite the same. The Wertheim operation is intended to accomplish in cancer of the uterus what the "complete" operation does in cancer of the lip or cancer of the breast. There is little evidence, however, that cases of cancer of the cervix which have extended beyond the point of origin are cured by the Wertheim operation. The operation is one of great technical difficulty, attended by a considerable mortality, and with frequent and annoying complications. Under these circumstances we must consider whether the destruction of the local lesion by radium, without mortality and without complications, does not offer advantages over the radical operation. By its use in inoperable cases we find that destruction of the local disease with radium can often be accomplished. The technique now employed is practically a minor operative procedure. The patient is given a brief anesthesia, the cervical canal is dilated and examined, a specimen is taken for microscopic examination, and tubes of emanation are introduced both in the cervical and uterine canal, and into the tissues of the cervix as well.

It is my belief that the time has now come when it is justifiable to treat a series of early and operable cases by radium alone. Until this is done, we shall have no positive facts upon which to go in drawing our conclusions.

### DISCUSSION OF DR. BARNEY'S PAPER.

Dr. Arthur L. Chute, Boston: There are two or three things in Dr. Barney's paper about which I would like to speak. In the main I agree with him: in some particulars, however, I differ. I am glad to find somebody else who does a perineal operation at times rather than confine himself to the suprapubic removal of the prostate. Although I do the perineal operation less often than the suprapubic, I believe there are a certain number of cases in which it is the only satisfactory way to attack the prostate and that it should be used more often than it is.

As regards spinal anesthesia, I agree with Dr. Barney entirely. I think its use is one of the greatest advances we have made in urinary surgery. Its use saves damaged kidneys from the injury ether would inflict on them and allows one to do cases one could not do safely if one were limited to ether as an anesthetic. I have used spinal anesthesia in many cases, well over a hundred times, and have had no deaths. I see patients get pallid and occasionally I am greatly concerned about them, but they all get well, and I deplore what I believe to be the great exaggeration of the dangers of spinal anesthesia, especially when these reports are based on a small experience with it. I do not contend that spinal anesthesia is without its danger; but I do believe that it has a very definite field, and I think it is distinctly indicated when there has been renal back pressure; and, too, that it may be used to great advantage in many pelvic conditions as well as in a certain number of conditions in the lower abdomen.

I cannot agree with Dr. Barney in the type of perineal incision that he employs in perineal prostatectomy, if he employs, as I understand it, the regular perineal section incision. This seems to me far less desirable than the cross incision. With this latter one makes a careful dissection of the perineum and opens the urethra behind the point where his incision may involve the fibers of the cut off muscle—this, I believe, lessens the liability of post-operative incontinence, a condition that is not unknown with the straight incision.

Dr. Barney says that a certain number of instances of malignant prostate are not definitely recognized before operation: with this I quite agree. An advantage of the cross incision and dissection of the perineum is that in cases of this sort one is much more favorably placed to dissect out the malignant prostate than one is with the longitudinal incision, in which the enucleation must be done in the depth of the wound rather than under the eye.

Dr. J. Dellinger Barney, Boston, (closing): I have practically nothing to add except that I think the straight incision unquestionably has an advantage, but I do not agree with Dr. Chute that it gives any less room for the removal of a prostate. The incision is made longer than usual and one can retract the edges of it and see and work perfectly well. I also do not see how the cut-off muscle can be influenced by the incision because whether V-shaped or perpendicular, the incision does not involve anything but the superficial tissues and does not touch the cut-off muscle in any way. It is practically the incision of an external urethrotomy for stricture, and the prostatic urethra and the posterior aspect of the prostate are developed by the finger by blunt dissection. So I do not think there are any cases where trouble is encountered with this incision. I have not looked it up with reference to the cross incision, but I am willing to be shown.

## Original Article.

# A NOTE ON GLIOMATA WITH REPORT OF A CASE.

By Henry Viets, M.D., Boston.

[From the Departments of Neurology and Neuropathology, Harvard Medical School; and the Departments of Neurology and Surgery, Massachusetts General Hospital.]

A glioma of the right temporal lobe of the brain with extension into the sub-arachnoid space to the conus terminalis of the spinal cord is reported. The occurrence of symptoms referable to both the brain and the spinal cord and the method of extension of this tumor along a serous surface are of interest from both the clinical and pathological viewpoints. Both of these factors are sufficiently rare to make the case worthy of a record in the literature of brain tumors.

*History and Operation.* Mr. M., aged 50, entered the Massachusetts General Hospital in October, 1915, with the subjective symptoms of headache, pain in the back and consequent inability to work. His family history was not important. In his past history it was noted that cramps in his legs had bothered him for years, and that a few dizzy spells with momentary loss of consciousness were symptoms of the last three years.

His present illness began insidiously about four months before entrance to the hospital with an increase of the dizzy spells associated with blurring of vision; four weeks later headache began which gradually grew increasingly severe and for two weeks was associated with vomiting. He had also noticed pain in the small of his back up to his neck, around both sides of the abdomen and the thorax and down to his knees, with a sensation of walking on air.

On physical examination the day of entrance the important neurological points found were the following: right pupil larger than the left, both reacted to light and accommodation, knee jerks and ankle jerks both increased but no clonus or Babinski sign. There was moderate weakness of his legs with some ataxia. Some tenderness was noted over the second lumbar vertebra. When examined three days later there was a marked Babinski sign of the right great toe, and the fundi showed mild optic neuritis with an old hemorrhage in the left retina. Five days later the patient became irrational and lost control of his sphincters. Three days after this no knee or ankle jerks were obtained, nor was there a Babinski sign. Two weeks later he developed signs of a right hemiplegia and nystagmus of both eyes. He was slightly irrational and complained of tasting gas and smelling tar. Temperature, pulse and respiration were normal. His blood Wassermann reaction was negative, his white blood count 10,000, blood pressure 125 systolic, 100 diastolic. Lumbar puncture gave a clear, greenish yellow fluid, pressure 170 mm., 15 mononuclear cells, globulin reactions positive and Wassermann negative; a partial compression syndrome.[1] Collodial gold reaction negative. X-ray of spine at various levels was negative. A week later his headache, vomiting and general signs of intracranial pressure had greatly increased. There was a double choked disk of four diopters.

He also developed a left homonymous hemianopsia.*

*Autopsy: Gross Pathology of Brain and Spinal Cord.* Weight of the brain was 1397 grams. The left parieto-temporal lobe in the region of the trephined opening bulged slightly. On the right side of the base, beginning in the region of the pons and medulla and extending forward along the right cerebral peduncle and the anterior portion of the inferior surface of the right cerebellar hemisphere, and along the right temporo-sphenoidal lobe as far as the optic chiasm, and crossing over a portion of the left cerebral peduncle as far as the left temporo-sphenoidal lobe, there was a slightly elevated grayish, granular layer which continued downward in the pia-arachnoid over the medulla and the spinal cord.

On horizontal cross section of the brain anterior to the optic chiasm, there were no pathological changes. A section just posterior to the optic chiasm (Figure 1) presented an ovoid tumor of the right temporal lobe, roughly 4 x 5 cm. At this point the tumor extended from the mesial aspect of the base of the temporal lobe transversely along the right wall of the third ventricle which was moderately bulged to the left as far as the internal capsule. The tumor did not enter the third ventricle. Its dorsal boundary cut the nucleus lentiformis nearly in half in a horizontal direction, most of the globus pallidus and the more ventral portion of the putamen. These structures were replaced by tumor tissue. Laterally the growth extended to the claustrum, a part of this being involved also. The tumor thus replaced the right optic tract, a large portion of the putamen and invaded and replaced the amydaloid nucleus. The tumor consisted of a pinkish gray, homogeneous tissue which in places showed extensive yellowish, homogeneous areas and some minute brownish-red areas. Part of the tumor in the region formerly occupied by the putamen showed evidence of a shallow cavity.

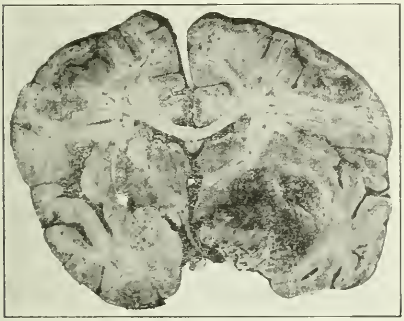

Fig. 1. Cross section 1 cm. posterior to optic chiasm. Note tumor of right temporal lobe replacing part of the nucleus lentiformis, optic tract, and amygdaloid nucleus.

In a brain section 1 cm. posterior to the first section (Figure 2) the tumor was in approximately the same area as Figure 1. In the dorsolateral aspect of the tumor, however, was a cavity 2 x 3 cm., the walls of which were irregular and lined with dirty grayish soft tissue. The cavity contained a small amount of pale, cloudy, reddish fluid. The tumor in this section invaded the whole of the nucleus lentiformis and distorted the external capsule and the island of Reil to a slight degree. The cerebral peduncle and Ammon's horn were entirely replaced by tumor tissue. The inferior horn of the lateral ventricle, which just appeared

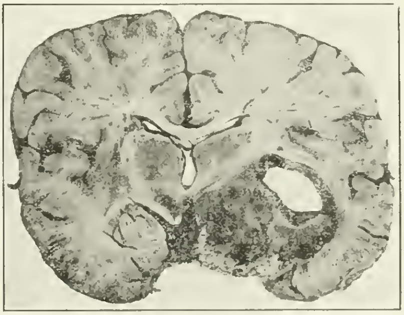

Fig. 2. Cross section 1 cm. posterior to Section 1. Note cavity formation replacing Ammon's horn and obliteration of inferior horn of lateral ventricle.

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* This patient, under observation five weeks, had developed signs during this period of both an intracranial lesion and one of the spinal cord. In the last week of the five there were marked general pressure symptoms, headache, vomiting, choked disk and partial coma. Also important, from the standpoint of localization, was the right hemiplegia, the left homonymous hemianopsia and the hallucinations of smell and taste which were very prominent symptoms. The signs of spinal cord disturbance were very distressing pains of the root type, loss of control of the sphincters, weakness of his legs, with vague sensory symptoms and ataxia, and the coming and going of deep and superficial reflexes. His spinal fluid was also suggestive of some blocking of the subarachnoid space at the distal end of the spinal cord. It was extremely difficult to decide what operation, if any, was advisable. There was the choice of attempting to explore the left parietal region, the right temporal region, or to do a laminectomy. The right hemiplegia was definite enough to indicate exploration of the left hemisphere although we were unable at that time to explain the left homonymous hemianopsia or the cord symptoms. There was no "level" indicated for a laminectomy and the general intracranial pressure signs were so severe that the craniectomy was decided upon. Six weeks after the patient had entered the hospital a large left parieto-temporal bone flap was turned down, but no exploration was attempted at this time. Ten days later a second operation over the same area failed to reveal any pathology in the parietal or temporal lobe.

The patient never recovered from this second exploration and died three months after entering the hospital, subsequent to weeks of coma.

on the left in this section, was completely obliterated by the tumor on the right side.

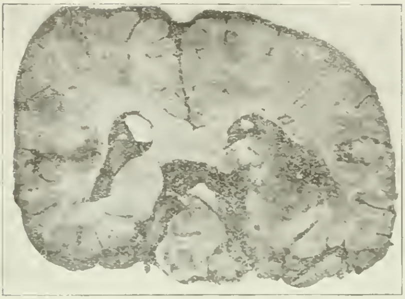

FIG. 3. Cross section 3 cm. posterior to optic chiasm, including pontine part of medulla. Note tumor partly filling inferior horn of ventricle, extension of tumor to ventral surface of pons, compression of pons. No invasion of pons.

The next section (Figure 3) was taken 3 cm. posterior to the optic chiasm and included the pontine part of the medulla. The tumor was seen filling the inferior horn of the lateral ventricle on the right and largely filling the body of the ventricle. There was no evidence of extension anteriorly along the walls of the ventricle, the surfaces of which were not granular or sandy in appearance. The ventricle was not dilated. At this level of the brain the tumor was seen extending out from the temporal lobe towards the mid-line in a ventral position, over the pulvinar, to the right lateral surface of the pons. As the tumor appeared on the ventral surface of the pons it distorted the normal contour of this structure to a marked extent and thus compressed the transverse fibres and pyramidal fasciculi of the pons, especially on the right, where the tumor was about 1½ cm. in thickness. The new tissue passed below the pons to the opposite side and ascended dorsally the lateral border of this side as far as the junction of the pons and cerebellum. After the tumor left the temporal lobe it was entirely confined to the pia-arachnoid space. Thus, in stripping off the pia from the ventral surface of the pons, the tumor was removed with it, leaving the surface smooth and clean without the slightest evidence of invasion of its structure. This was true of all the tumor tissue found on the base of the brain outside of the temporal lobe, except the part of the tumor at the junction of the temporal lobe, cerebellum and pons where there had been slight invasion of the cerebellum.

The tumor thus extended in the temporal lobe from a point at about the level of a cross section through the middle of the pons (tip of inferior horn of lateral ventricle) to an anterior boundary at about the level of a cross section through the optic chiasm. It was continuous with the grayish, slightly elevated granular layer previously described as present on the surface at the base of the brain.

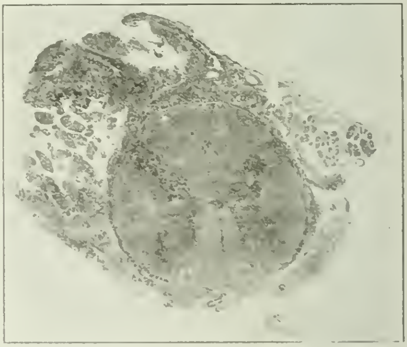

FIG. 4. Upper lumbar cord. Note tumor completely surrounding cord; no invasion.

The spinal cord throughout its length showed evidence of tumor tissue in the pia-arachnoid membrane in three or four places in the cervical and upper thoracic region and in two or three in the lumbar region. The new tissue formed small, ovoid swellings along the cord. Sections through the cord at various levels revealed the tumor in the pia-arachnoid membrane of all levels. There was apparently no penetration of the cord itself at any point; the pia could be elevated with the tumor, leaving a smooth, clean surface of the cord below. At the level of the pyramidal decussation the tumor was scanty, situated mostly on the dorsal surface and to the left of the mid-line. Just a centimeter below this point the tumor formed a 0.3 centimeter swelling on the right dorsal surface. Throughout the lower thoracic and upper lumbar region the tumor was abundant on all surfaces of the cord. In the upper lumbar region especially, the tumor completely surrounded the cord increasing its diameter to nearly double (Figure 4). In the lower lumbar region the tumor was somewhat smaller and occupied again largely the dorsal surface of the cord. Extension in the sub-arachnoid space was noted to the tip of the conus terminalis. There did not appear to be any growth outward along the nerve roots. There was no evidence at any point along the spinal cord of penetration by tumor of either the arachnoid membrane or the pia.*

*Microscopic Pathology.* A section of the temporal cortex extending into the area of the tumor and through the cavity of the tumor was studied microscopically. The section was about the level of Figure 2. The following points were noted. There was a slight pial gliosis of the cortex, especially well marked at the base of sulci. The cell layers were well marked and the cells appeared normal. The blood vessels showed no changes. Beneath the cortex the white matter appeared normal but there was a well marked layer of sub-ependymal gliosis along the free edge of the ventricle. In many places the ependyma was increased to four or five layers especially near the junction of the lining and the tumor growth. As one approached this junction the ependymal cells stained less deeply. One could not be sure that the tumor grew from this ependymal layer but the sections are very suggestive of this. Certainly the change from the ependymal cells to tumor cells was not an abrupt one and the tumor cells near the junction had all the appearance of ependymal cells except that they were more irregular in size and shape. Dorsal to the tumor mass the division between the tumor and the white matter was not well marked. There was a more or less gradual transition from the normal neuroglia of the white matter to the glia cells of the tumor. Between the two there was an extensive area of gliosis of a slightly different character from the glia proliferation seen in the tumor. The cells took a deeper stain, as did the fibrils. This gliosis was especially well marked around the blood vessels which proliferated somewhat in advance of the tumor growth. It would seem as if there was a cellular glia reaction just ahead of the tumor which the tumor as it grew would infiltrate and replace.

The different parts of the tumor tissue itself showed marked variations. Four fairly well marked areas could be distinguished: (1) an area of loose glia reticulum; (2) an area of necrosis; (3) an area of closely packed glia cells, and (4) an area of small, prominent blood vessels.

The area of loosely packed cells showed a large amount of intracellular substance. The cells had a tendency to form in lines of whorls giving the whole picture a wavy appearance. Many nuclei were oval or round with well marked nucleoli and nuclear granules; the cytoplasm of these cells was faintly stained. Other nuclei were almost rod-shaped with heavily staining granules; in these the cytoplasm was more marked. Still other nuclei were irregular in shape and stained more lightly. Mitotic figures were occasionally seen but no multinuclear cells. Neuroglia fibrils were moderately abundant, running in all directions without obvious connections with the cells. Capillaries in this area showed a single layer of normal endothelial cells.

The second type of field, the areas of necrosis with only a few cells and a mass of detritus, was found scattered throughout the tumor. Near these areas small arteries were seen completely filled with blood clot. Thrombosis of the blood vessels was very common. These fibrin clots stained deep blue with Mallory's nuclear stain. Many of the smaller vessels were completely obliterated, others partly so. No tumor cells were seen in the blood vessels.

The third area of closely packed cells showed very little intracellular substance. Almost no fibrils were seen in these areas and the few that were made out were packed closely together between cells in marked contrast to the loose arrangement of the first area. The cells had large oval nuclei which stained deeply. A few capillaries were present. Small cystic spaces about the size of capillaries were common. The cells showed marked annular arrangement. This type of tissue was found nearest to normal white matter but did not appear to grow into it.

The fourth area of prominent blood vessels was nearly one-half filled with fine blood channels lined with a single layer of endothelial cells. These seemed to run in all directions and could be seen between the cells in almost every part of the field. They were so numerous that the section suggested an angioma. Where such an area was slightly necrotic all these vessels were filled with masses of fibrin.

Another section through the tumor at the level of its leaving the temporal lobe and presenting itself on the ventral surface of the pons was observed. The tumor here presented the picture described above as the third area of closely packed glia cells with few fibrils and no areas of necrosis. The blood vessels were few in number and showed no thrombosis. The cells at this point showed a marked tendency to annulate. The nuclei were small, deeply staining, and mostly round. The tumor was completely confined to the subarachnoid space and there was no evidence of penetration into the pons. The pons showed no reaction in any way to the tumor although it was markedly compressed by it in many places. Where this compression had taken place, the pontine fibers seemed only more closely packed together and the tumor was seen passing along the edge of the pons and up along its lateral border to enter the cerebellum.

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* Part of the description of the gross specimen is from the autopsy record of the Massachusetts General Hospital, for which I am indebted to Dr. J. Homer Wright.

Another section at the base of the cerebellum, at the junction of the pons, cerebellum and temporal lobe was studied. The tumor tissue appeared in the meshes of the pia over the cerebellar convolutions and at one or two places invasion seemed to have taken place. At these points the cerebellum was replaced by the tumor. Adjacent to these replaced areas the cerebellum showed a reaction to the foreign body. The granular layer was largely replaced by glia tissue. Purkinje cells had largely disappeared and the tumor cells were found here and there in the granular layer. In places the tumor had definitely taken on the architectural form of the cerebellum. The cells had a marked tendency to form themselves into lines, in places resembling the three or four cell layer of ependymal cells seen on the wall of the lateral ventricle. The tumor cells had oval nuclei, sharply defined granules with well marked nucleoli and little or no visible cystoplasm. There were many wavy fibrils. These cells had the same appearance as the tumor cells found in the temporal lobe.

A section through the cervical spinal cord showed the tumor largely on the dorsal surface although it could be traced in the sub-arachnoid space entirely around the surface of the cord. The cord itself was not invaded at any point and appeared normal. The nerve roots appeared normal, although completely surrounded by tumor, especially the dorsal roots. The tumor exhibited the same characteristics microscopically as seen in the temporal lobe.

In microscopic sections of the thoracic and lumbar cord the tumor was shown confined to the pia-arachnoid. There was no invasion of the spinal cord at any point. The tumor gave the same microscopic appearance as noted above.

### DISCUSSION.

The autopsy was helpful in throwing light on our bizarre symptomatology. The general pressure symptoms of loss of consciousness, dizzy spells, headache, vomiting, blurring of vision, optic neuritis and later choked disc were all explained by the tumor mass in the cranial cavity. The hallucinations of tasting gas and smelling tar can be attributed to involvement of the right uncinate gyrus by the tumor. The left homonymous hemianopsia was the result of cutting the optic radiation in the temporal lobe or pressure on the right optic tract before the chiasmal crossing. The right hemiplegia was more difficult of explanation even after the pathology was known. Unfortunately this sign led us astray and caused a futile exploration of the left parieto-temporal region. The hemianopsia and the uncinate attacks should have turned us towards the right temporal lobe, the correct site of the lesion.

The spinal cord symptoms of diffuse root pain and sensory changes and ataxia in the legs combined with alterations of the reflexes of the leg from exaggeration with a Babinski sign to loss of reflexes were all explained by the growth of the tumor in the sub-arachnoid space and its variations of pressure at different levels of the cord.

Pathologically this case of brain tumor showed the characteristics of a malignant glioma with a marked tendency to extend along surfaces. A remarkable tumor with this same tendency has been described by Mallory,[2] who, in 1908, reported a glioma originating in the lumbar region of the spinal cord which infiltrated and destroyed the lower part of the cord and then spread to the pia and along it into the arachnoid space forming a thick layer surrounding the cord throughout its entire length. It also extended over the cerebellum and cerebrum. Councilman[3] has reported two cases which he describes as follows: "A glioma originating in the pons grew over this in a mass which resembled a mass of plaster poured over the surface of this and along the entire length of the cord." In this latter case, as well as in the case reported by Mallory, the cord was infiltrated.

### SUMMARY.

A brain tumor, glioma, of the right temporal lobe is reported which infiltrated and largely replaced the tissues of the lobe without deformin the general shape of the brain. A large cyst was formed. The tumor extended to the base of the brain and bulb where it ran in the sub-arachnoid space over a large part of the ventral surface of the brain and extended down the spinal cord to the conus terminalis without invasion of any part of the central nervous system except a small portion of the left cerebellum. The medulla and cord were greatly compressed by the tumor mass. The symptoms and signs of both a brain and spinal cord tumor are recorded with the report of a negative surgical exploration. Both macroscopically and microscopically the tumor showed the characteristics of a malignant glioma. The case illustrates in a striking manner the tendency of a glioma to extend along a serous surface without invasion.

REFERENCES

[1] Aver and Viets: Jour. A. M. A., 1916, lxvii, 1707.
[2] Mallory: Jour. Exp. Med., 1908, x, 575.
[3] Councilman: Colorado Med. 1915, xii, 289.

## Book Reviews.

*Hygiene: Dental and General.* By Clair Elsmere Turner. St. Louis: C. V. Mosby Company. 1920.

A fundamental knowledge of general hygienic principles and definite information about the interrelationship between abnormal conditions of the mouth and other organic and systemic defects is requisite to the successful pursuit of the dental profession; yet there is perhaps no book other than *Hygiene: Dental and General* written for the dental student and practitioner which presents the subject of general hygiene with special reference to the needs of the dental profession. In considering the hygiene both of the mouth and of the body as a whole, the text has been arranged with reference to two distinct sets of problems: (1) the proper development and normal functioning of the parts, and (2) the problems arising because of the presence of infectious organisms. The first five chapters of the book deal with the former aspects of dental and personal hygiene: the hygiene of the mouth, the hygiene of nutrition, action, reproduction, and the hygiene of the central nervous system. In the remainder of the book the author has discussed the development of disease prevention and its effect upon dental practice, personal hygiene, and the public health, presenting chapters on immunity, communicable diseases, public health administration, food control, water supply, waste disposal, and school and industrial hygiene. There have been included also chapters by William Rice on Dental Hygiene and Oral Prophylaxis. The bearing of all these subjects upon the problems encountered in the ordinary practice of dentistry is an intimate one. Dr. Turner has given a comprehensive survey of the whole field of dental and general hygiene, considering not only the teeth, but other organs of the body as well, and even environmental factors outside the body. The book is well illustrated and represents logical and original thought on the subject of dental and general hygiene.

*Vaccination in the Tropics.* By W. G. King, C.I.E. London: Tropical Diseases Bureau. 1920.

Although the toll of human life made by smallpox in most of the tropical possessions of Great Britain is heavy, there is available practically no literature in the English language, with the exception of this volume, "Vaccination in the Tropics," which gives authoritative information on the institution and maintenance of vaccine establishments in the tropics. The present volume has been prepared by Colonel King at the request of Viscount Milner, Secretary of State for the Colonies, for distribution to the governments of the tropical African dependencies. It is an excellent treatise on the subject, and will be of inestimable value to the isolated worker confronted by the problems it describes. The book is divided into two main sections,—the first dealing with various factors of smallpox incidence and methods of protecting populations; the second, with animal vaccine. Various types of smallpox, their respective mortalities, and epidemic cost are considered, together with the respective values of inoculation, vaccination, and natural smallpox. Valuable information is given in regard to the equipment needed by vaccinators in tropical countries and in regard also to various modes of operating, the development of vaccine in the human subject, the after-treatment of vaccination, and the sequelae of vaccination. Detailed consideration is given to the cultivation, rejuvenation, and preservation of animal vaccine. In an appendix is described Noguchi's method of purification of vaccine. Plates and diagrams illustrate the text. This book is a valuable contribution to an important and inadequately reported subject.

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## PROFESSIONAL INCOME: HOW THE FEDERAL TAX APPLIES TO THE MAN OF THE PROFESSIONS.

To the professional man the problem of correctly making out an income tax return for the year 1920 is somewhat more involved than that presented to the salaried man. The wage-earner on a fixed salary has an accurate estimate of the amount of compensation received for personal services, while the professional man's income varies from year to year. In the professional class may be included the physician, dentist, lawyer, architect, veterinarian, author and clergyman. Each must figure up his net income for the last year. If single, or if married and not living with his wife, and his net income was $1,000 or more, or if married and living with his wife and his net income was $2,000 or more, a return must be filed.

The exemptions are the same as for the year 1919: $1,000 for single persons and $2,000 for married persons living with husband or wife, and heads of families, plus $200 for each person dependent upon the taxpayer if such persons are under 18 years of age, or incapable of self-support because mentally or physically defective. The period for filing returns is from January 1, to March 15, 1921.

The professional man must make a return of all fees, salaries and other compensation for services rendered, together with income from all other sources. If he keeps his accounts on the "receipts and disbursement" basis—which means a record of the amount received and the amount paid for expenses—he should file his income tax return for the year 1920 on that basis. If he keeps books showing income accrued and expenses incurred during the year, he must make his return from his books and include all income, even though not entered on his books. If books are kept on the accrual basis the taxpayer must include all income that accrued, even though not actually received, and may deduct items of expense, although not actually paid. Both the receipts and disbursement basis and the accrual basis are explained in instructions on the forms for filing individual returns of income.

This constitutes gross income from which the taxpayer is allowed certain deductions in arriving at net income upon which the tax is assessed. Among such deductions are the cost of supplies used by him in the practice of his profession, expenses paid in the operation and repair of an automobile used exclusively in making professional calls, dues to professional societies and subscriptions to professional journals, rent paid for office room, expense of fuel, light, water, telephone used in his office, and the hire of the office assistants. Amounts expended for books, furniture and professional instruments and equipment of a permanent character are not allowable deductions. In the case of a professional man who maintains an office, but incidentally receives at his home patients, clients, or other callers in connection with his professional work, no part of the rent of the home is deductible. If, however, he uses part of the house for his office, such portion of the rent as is properly attributable to such office is a deductible item.

A reasonable allowance is made for depreciation, or wear and tear of equipment and instruments used by professional men. When, through some new invention or radical change in methods or similar circumstances, the usefulness in his profession of some or all of his instruments or other equipment is suddenly terminated, so that he discards such asset permanently from use, he may claim as a loss for that year the difference between the cost (reduced by reasonable adjustment for wear and tear it has undergone) and its junk or salvage value. If the apparatus was owned prior to March 1, 1913—the date the first income tax law became effective—its fair market value at that date should be considered instead of its cost in figuring depreciation and obsolescence.

Deductions for uncollectable fees form an important item in the returns of many professional men. To be allowed as a deduction, a debt must be worthless and must have been charged off within the year in which its worthlessness was discovered. The return must show evidence of the manner in which discovery was made. For example, statement should be made that the debtor has been discharged from bankruptcy or has disappeared, leaving no trace, or that all ordinary means of collections have been exhausted.

A debt proved to be worthless is not always a proper deduction. Unpaid amounts representing fees for professional services are not allowed as deductions unless included as income in the return for the year in which the deduction is sought or in a previous year. The fact that expected income was not received does not reduce the taxable income. If a debt is forgiven it cannot be deducted, because it is then regarded as a gift. A debt may not be charged off or deducted in part, but must be wholly worthless before any part can be deducted.

Compensation in any form for professional services must be included as income. If a physician, lawyer, or other professional man should receive from a merchant goods in payment for professional services, the fair market value of such goods must be included as net income.

Forms for filing returns are now available at offices of collectors of internal revenue and branch offices. Collectors will mail to each person who last year filed a return a copy of the return form for 1920. Failure to receive a form, however, does not relieve a taxpayer of his obligation to file a return and pay the tax on time. Taxpayers whose net income for the year 1920 was $5,000 or less should use Form 1040A. Those whose net income was in excess of $5,000 should use Form 1040.

In addition to the individual forms, partnerships must file a return of income, or even if there was no net income, on Form 1065. Partnerships as such are not subject to the income tax. Individuals carrying on business in partnership, however, are taxable upon their distributive shares of the net income of such partnerships, whether distributed or not, and are required to include such shares in their individual returns. The return must show the name and address of each partner and his share of net income.

The tax this year, as last, may be paid in full at the time of filing the return—on or before March 15, 1921—or in four equal installments, due on or before March 15, June 15, September 15, and December 15. Payment may be made by cash, money order or check, which should be made payable to "Collector of Internal Revenue." The return must be filed with the collector for the district in which the taxpayer lives or has his principal place of business. Heavy penalties are provided by the revenue act for failure to file a return and pay the tax within the time prescribed by law.

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## MEDICAL NOTES.

The Bowdoin Medical School.—The Bowdoin Medical School in Maine will cease to be a department of Bowdoin College at the end of the current year in June, unless it receives financial support. The following announcement, by authority of the boards of trustees and overseers, has been made by President Kenneth C. M. Mills:

By action of the board of trustees and overseers the Bowdoin Medical School will be finally closed as a department of Bowdoin College at the end of the current year, June, 1921, unless by that time some way shall be found to meet the requirements necessary to keep the school in Class A of American medical colleges. It has been conservatively estimated that for this purpose there must be an addition to the resources of the school of $25,000 for immediate equipment of laboratories and of at least $50,000 yearly income for more teachers and for up-keep. Unfortunately at the present time the college sees no way of procuring such funds; the need of such an endowment has often been placed before the people of Maine, but the appeals have never received an adequate response.

The college will not apply for state aid for the school. But if the citizens of Maine and the friends of medical education who believe that the maintenance of a medical school is properly a state function, desire to have the medical school reëstablished as a state institution under state control and adequately supported by the state, Bowdoin College will be glad to give all assistance possible to that end, and would doubtless offer for such a purpose for temporary use, if desired, such part of the buildings and apparatus of the college as might be available.

The trustees and overseers of the college believe that there is a place for a medical school in Maine and are hopeful that the people of the state, despite the great demands on the incoming legislature, will establish such a school as a state institution, around which all the medical and public health work of the state would be centered.

"Certified" Water.—Within the last 12 months the danger to railway travellers of infection with typhoid fever, dysentery, and other water-borne diseases has been reduced to a minimum throughout the greater part of the country by the coöperation of the U. S. Public Health Service with the different state boards of health in the testing of the water used on railway trains for drinking and cooking. Within the next few months, similar protection will be afforded to passengers on river and lake steamers and ocean steamships sailing from American ports. This will tend to end the severe outbreaks of typhoid fever that from time to time have been traced to ships (especially to excursion boats) as well as to the probably more numerous but far less easily traced illnesses of railway travellers from similar pollution.

The following statements in regard to this work have been made by Surgeon-General Cumming of the United States Public Health Service:

"The work was really begun in June of last year, when at the convention of state and territorial health officers, in session at Washington, D. C., a plan was decided upon whereby the Service was to coöperate with the States in reducing typhoid fever, either by sending them sanitary engineers to investigate their water supplies or by helping them to organize State divisions of sanitary engineering to look after the work.

"Work has since been done in nearly half the states of the Union, in many of which sanitary divisions were lacking. In nearly all of these, such bodies have been or are now being organized; and in about half of them surveys have been made of many or all important water supplies, most of which have been found safe for use on trains. Periodic inspection is, however, of course necessary.

"In carrying out this work the Public Health Service has grouped the states east of the Mississippi River into four districts and it will group those west of the Mississippi into five other districts as soon as may be practicable. Each district will be provided with a sanitary engineer from the Service, who will render aid to the state sanitary officers in this group when requested.

"In the Great Lakes Division, the work is a little different, for at present it has to do with the investigation of the sources and the handling of water supplies for vessels on the lakes. It is believed that the information obtained will permit us to frame regulations to govern the water supply of all vessels on American lakes and rivers sailing from American seaports."

War Mortality Rates.—Final figures on army casualties in the World War are contained in the annual report of Surgeon-General Ireland. There were 34,249 men killed and 224,089 wounded.

The proportion of killed to wounded is about the same as in the Civil War, although mortality from gunshot wounds in the World War was only 8.26 per cent. as compared with 13.6 per cent. in the Civil War. The report indicates that improved surgical and sanitary methods in the recent war saved the lives of 5.34 per cent. of all American soldiers wounded.

Of every 1000 men sent to France, 110 were admitted to the hospital as the result of battle casualties, and nearly seven men out of every 1000 died as the result of wounds. Infantry losses were heaviest, 215.6 out of every 1000 men being wounded and 12.77 killed. The signal corps was next with 52.22 wounded and 3.13 killed per 1000.

Deaths from wounds totalled 13,691, or slightly more than 6 per cent., while 158,585 of the wounded, or 70.7 per cent., were returned to duty, the remainder being invalided home for treatment or discharge. Shell wounds were by far the most fatal.

Last Foreign Quarantine Station for the Public Health Service.—With the transfer, now imminent, of the New York Quarantine Station to the U. S. Public Health Service, the Federal Government will come into complete possession and administrative control of the country's inner line of defense against disease coming from abroad.

Legislation first adopted in 1893 and subsequently supplemented, provided for the purchase by the Federal Government of the seaport quarantine stations of such states as might be willing to part with them. Most states were glad to be relieved of the expense of carrying on a work that was essentially one for national rather than local protection; but some of them hesitated to give up local control, especially in the early days when ideas of proper quarantine methods differed radically, owing to the lack of information now available as to the transmission of the great plague diseases.

However, one by one the stations were taken over until only New York was left; and now the agreement for its transfer has been reached and formal action waits only on the presentation by the State of proof of title to the premises.

Public Health Service to Transfer Tuberculosis Patients to the East.—All the hospitals and contract hospitals of the U. S. Public Health Service in the semi-arid southwest are already crowded with tuberculosis patients and the influx of others from the Eastern States continues so great that the Public Health Service has been forced to transfer patients from Tucson, Ariz., and other western hospitals to sanatoriums near Asheville, N. C., and elsewhere in the East.

Many ill-advised patients have of late thronged to Tucson, unmindful of the fact that every hospital bed in that place is filled and every hotel and boarding house overcrowded. More than 500 tuberculosis subjects in Tucson are unable to find entrance to a sanatorium. Other towns in the Southwest report similar conditions.

Surgeon-General Cumming again renews his warning against tuberculosis patients leaving sections where the Government is able and willing to care for them and going to the Southwest on their own initiative.

Public Health Service Institute.—The nature of the attendance at the institute of the Public Health Service on venereal disease control, recently held in Washington, furnishes striking evidence of the fact that modern warfare on disease is not exclusively nor even chiefly medical. Prevention, in disease as in everything else, is now considered even more important than treatment; and prevention is very largely a social problem, in solving which every class of the community has its part. Thus, the institute, which conducted two weeks' intensive training for 511 medical men and women and social workers, who had come from all parts of the continent to familiarize themselves with the recent marvellous advances in both the medical and the social aspects of the twin diseases, had among its students more than a hundred physicians of high standing, 48 directors of clinics, 47 nurses, 22 police women, 15 educators, and about 50 national, state and city health officers, editors, travellers'-aid secretaries, athletic directors, Y. M. C. A. secretaries, and representatives of other important social agencies.

University of Cincinnati Medical School.—A gift of $700,000 has been offered by the General Education Board of New York to the Medical College of the University of Cincinnati on condition that there be raised an additional sum of $1,300,000 to complete the $2,000,000 endowment fund of the college. There has been subscribed to this amount $900,000.

This year marks the one hundredth anniversary of the founding of the Medical College. One hundred years ago, the Medical College of Ohio received its charter from the state—the first medical school established west of the Alleghanies and the third oldest in the country. Dr. Daniel Drake was the first president of the college, which was then called the Medical College of Ohio. The first class of twenty-four students was graduated in 1821. In 1896 the college became the medical department of the University of Cincinnati, and in 1909 the Miami Medical College also became a part of the University. The building of the present medical college and the city hospital was largely the achievement of Dr. Christian R. Holmes. At the exercises held in celebration of the centenary of the Medical College on November 6, 1910, a historical sketch of the college was given by Dr. J. C. Oliver; Dr. William T. Sedgwick, of the Massachusetts Institute of Technology, spoke on the relationship of medicine to public health; and Dr. Joseph Ransohoff reviewed the work of Drake and Holmes and other teachers in the college.

Resignation of Dr. D. R. Hooker.—In order to engage entirely in research work, Dr. D. R. Hooker has resigned his position as associate professor of physiology in the Johns Hopkins Medical School.

Absence of Prof. C.-E. A. Winslow.—In order that he may assume the directorship of the public health activities of the League of the Red Cross Societies at Geneva, leave of absence has been granted by the Yale University School of Medicine to Prof. C.-E. A. Winslow. He will be in Europe during the spring term, and will return to New Haven for the opening of the fall term in October, 1921.

International Congress of Comparative Pathology.—At the second International Congress of Comparative Pathology which will be held at Rome in April, 1921, the subjects discussed will include influenza in man and animals, foot-and-mouth disease, recent researches in sarcoma and carcinoma, rabies and anti-rabic vaccination, piroplasmosis, acari and scabies in man and animals, and phylloxera. Under the presidency of Professor Perroncito, an organizing committee has been established, composed of Professors Ascoli, Golgi, Grassi, Lustig, Marchiafava, Paterno, Raffaele, Sanarelli, and Colonel Bertoletti.

Opportunities for Dietitians.—Opportunities are now open in the hospitals of the U. S. Public Health Service for the employment of dietitians of many women graduates of schools of Household Economics who have had student training or hospital experience in civilian or army hospitals. The work was transferred a year ago from the pharmacists to a newly established dietitian service. The section has steadily expanded, but owing to the opening of many new hospitals and the enlargement of those already in operation, the dietetic personnel is not equal to the requirements. Applications for appointment should be made to the Surgeon General, U. S. Public Health Service, Washington, D. C.

New Public Health Service Film.—A new motion picture film prepared for the U. S. Public Health Service, vividly presents the life history of the mosquito, especially of the kind that transmits malaria germs and costs the United States people about $200,000 a year by so doing. The views show how the female mosquito absorbs the malaria germs with the blood of a malaria patient; how the germs increase and multiply and pervade the salivary glands of the mosquito; and how the mosquito passes them on. The film was exhibited for the first time at the meeting of the Southern Medical Association at Louisville, Kentucky, November 15 to 18.

Public Health Service and Tuberculosis.—The migration of army patients suffering with tuberculosis to the semi-arid West is causing the U. S. Public Health Service no little concern, for all the service hospitals and all the contract hospitals in that region are now completely filled. It is considered to be very unfortunate that the patients should leave places where the Government is ready and able to care for them and go to other sections where it is absolutely impossible for it to provide care and where even ordinary housing accommodations are often unobtainable. The service is making and will continue to make every effort to meet the needs of the patients, but the great amount of migration to that part of the country makes the problem very serious.

Investigation of European Immigration.—Surgeon J. W. Kerr, of the U. S. Public Health Service, sailed for Europe on November 20 with Commissioner General of Immigration Caminetti, to assist in the investigation of emigrant conditions in Europe. The hope is to devise additional measures whereby the immigration laws may be given greater force and may yet work less hardship on prospective emigrants.

Pellagra and Poverty.—That pellagra varies inversely with the family income in the cotton-mill villages of South Carolina is the conclusion drawn after a three-year study of the U. S. Public Health Service. This is the first reported study in which the long-suspected relation of poverty and pellagra is definitely measured. It was found that as the income fell the disease increased and affected more and more other members of the same family. As the income rose, the disease decreased and was rarely found in families of even moderate means.

Differences among families with the same incomes are attributed by the report to differences in the expenditures for food, intelligence of the housewife, and ownership of cows and gardens. Differences among villages which were economically similar are attributed to differences in the availability and condition of food in local markets.

A recent statement of one of the largest life insurance companies in the United States indicates that the food standards of Southern wage-earners must have improved remarkably of late, for the death rate from pellagra has fallen from 6.7 per 100,000 in 1915 to 2.3 in 1919.

Chaulmoogra Oil and Tuberculosis.—The recent widely circulated statement that the U. S. Public Health had found that chaulmoogra oil was efficacious in the treatment of tuberculosis as it had been shown to be in that of leprosy, is said by Surgeon General Cumming to be unwarranted. Experiments made some years ago with the oil gave no definite results. Recent experiments with the ester, or derivatives, have been begun because of hopes based on some similarities between the bacilli of leprosy and those of tuberculosis; but these have not proceeded far enough to indicate what results will be obtained.

College of Medicine of St. Louis University.—Announcement has been made by the president of St. Louis University that Dr. John Auer, pharmacologist of the Rockefeller Institute of New York, has been appointed to institute and conduct a Department of Pharmacology in the College of Medicine of the University. It is the hope of the faculty of the University to be able, through the Centennial Endowment Fund of $3,000,000 now being raised by the friends and alumni of the institution, to establish complete departments in every line of medical instruction and research. It is also intended, if possible, to secure as heads of these departments men of professional standing equal to that of Dr. Auer, who has been connected with the Rockefeller Institute since its organization in 1903.

Need of More Hospitals.—In an annual report, it has been recommended by Dr. Hugh S. Cumming, surgeon-general of the Public Health Service, that additional hospital facilities be provided for the treatment of former service men and women. The report points out that 20,000 patients were receiving hospital care from the Public Health Service on last July 1 as compared with 2,000 in October, 1919.

"The Public Health Service reiterates its firm belief that an adequate hospital construction program should be undertaken by the National Government for the care of ex-service men and women. It is repeated that the special needs to be met are those of ex-service men and women suffering from tuberculosis and mental disorders. These groups of patients will require treatment for long periods of time and their demand is for care and treatment in governmental institutions."

British Reports of Conditions in India.—*The British Medical Journal* has called attention to the fact that in Bengal the rate of infant mortality runs as high as 30 per cent. in some districts, and is nowhere less than 20 per cent. The problem is one of great difficulty. Throughout the province good milk is dear and the people poor, mothers are ill-nourished, and trained *dhais* (mid-wives) rare. Poverty is at the bottom of most of this enormous waste of infant life, and social and economic conditions hamper the introduction of remedial measures.

A recent statement shows that in market week cholera was responsible for 724 deaths in Behar and Orissa, 570 in Madras, 213 in Bombay. Plague accounted for 433 deaths in Madras, and 175 in the Central Provinces. The total number of deaths from cholera was 1,800; 200 from smallpox, and 1,700 from plague.

A certain number of wandering lepers are reported to be in Lucknow. To facilitate their confinement in the Lucknow Leper Asylum, grants have recently been made to the asylum authorities. The general policy of the British Government on the subject of leper segregation is at present under consideration in view of the recent passing of the Lepers (Amendment) Act XXII of 1920.

## BOSTON AND MASSACHUSETTS.

New England Hospital for Women and Children.—From 1863, when the Hospital was incorporated, until 1872, all departments were carried on together. In 1872, the Hospital was removed to its present location in Roxbury, but the out-patient work, both clinics and home care, was continued at the old site on Warrenton street, and later at 29 Fayette street. To quote from our records of that date, "Owing to the distance of the new building from the crowded part of the city where the poor people reside, the dispensary was kept in the city proper." With the growth of the city and the present facilities for reaching the Hospital by several lines of cars, both surface and elevated, this reason no longer exists, and on January 1, 1921, the Out-Patient Department was transferred to the hospital plant, where the clinics are continued as usual, and medical and nursing service furnished to poor patients in their homes.

Berkshire School for Crippled Children.—By the will of the late Hon. W. Murray Crane of Dalton, the Berkshire School for Crippled Children, Pittsfield, Massachusetts, has been left fifty thousand dollars, to be used by direction of the trustees.

Graduating Exercises of Training School for Nurses.—The graduating exercises of the Training School for Nurses of the Massachusetts General Hospital were held on the evening of January 11 in the Moseley Memorial Building. An address was delivered by Reverend Henry K. Sherrill. The exercises were followed by a reception.

Funds for Hospital in Wayland.—In the will of the late Jonathan M. Parmenter of Wayland, provision was made for the sum of one hundred thousand dollars and an equal sum in bonds and stocks, to be used in establishing a hospital in Wayland or in its immediate vicinity.

Week's Death Rate in Boston.—During the week ending January 29, 1921, the number of deaths reported was 217 against 306 last year, with a rate of 14.93 against 19.74 last year. There were 32 deaths under one year of age against 54 last year.

The number of cases of principal reportable diseases were: Diphtheria, 73; scarlet fever, 51; measles, 70; whooping cough, 18; typhoid fever, 1; tuberculosis, 50.

Included in the above, were the following cases of non-residents: Diphtheria, 14; scarlet fever, 3; measles, 1; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 4; measles, 1; whooping cough, 1; typhoid fever, 1; tuberculosis, 14.

Included in the above, were the following non-residents: Tuberculosis, 2.

## Miscellany.

### SOCIETY NOTICES.

Beth Israel Hospital.—There will be a clinical meeting in the auditorium of the Beth Israel Hospital on Wednesday evening, February 9, at 8.15.

Program

Chronic Pancreatitis. Dr. Daniel F. Jones.
Discussion. Dr. John T. Bottomley and Dr. Roger I. Lee.

Physicians are cordially invited. The telephone is Roxbury 5940 and visitors may be on call.

Refreshments will be served.

Committee on Clinical Meetings,
Albert Ehrenfried, M.D.
Ward H. Cook, M.D.
E. Grenville Crabtree, M.D., *Sec.*

Harvard Medical Society.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance). Tuesday evening, February 15, at 8.15 o'clock.

Program

Medicine in Continental Philadelphia as Depicted in the Diary of Elizabeth Drinker. 1749-1807.
Drs. C. K. and Katherine R. Drinker.

Medical students and physicians are cordially invited to attend.

Cyrus C. Sturgis, *Secretary.*

East Boston Medical Society.—Dr. Richard C. Cabot will address the East Boston Medical Society on February 28, at 8 p.m., in Walcott Hall, Central Square, East Boston. His subject will be "Diseases of the Heart." Members of the profession are invited to attend.

Ernest L. Booth, M.D., *Secretary.*

### RECENT DEATHS.

Dr. James Edmund Sullivan died at his home in Providence, R. I., October 8, 1920. He was a graduate of the Bellevue Hospital Medical College in 1879, joined the Massachusetts Medical Society in 1883 and moved to Providence in 1889, retaining membership in the Massachusetts State Society.

Dr. Michael Edward Kean died at his home in Manchester, N. H., September 22, 1920, aged 57. He was born at Bedford, N. H., June 28, 1863, and was a graduate of Dartmouth Medical School in the class of 1889, joined the Massachusetts Medical Society in that year and soon settled in Manchester, keeping up his membership in the society until his death.

Dr. Edward Henry Bushnell of Quincy died at the United States Public Health Service Hospital, Parker Hill, Roxbury, January 23, 1921, aged 55 years. He was a graduate of the University of Vermont, Medical Department, in 1889, joined the Massachusetts Medical Society and settled in Quincy in 1901. At the time of his death, Dr. Bushnell was president of the Norfolk South District Medical Society. He was a Mason and is survived by one daughter. While in the Medical Corps of the Army he held the rank of captain.

Dr. Louis Allen Crocker died of "acute indigestion" at his home in Brewster, January 8, 1921, aged 57 years. He was born in Brewster, January 10, 1863, was educated at the town school, the Bridgewater normal school and at Brown University, where he took a Ph.B. in 1898. His M.D. was received at Harvard Medical School in 1902. After serving for a year as superintendent of Channing Hospital at Providence he settled in Brewster and joined the Massachusetts Medical Society. His widow, Hannah H. Knowles, who survives him, had no children.

# The Boston Medical and Surgical Journal

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## New England Surgical Society

### HEMORRHAGE FROM THE STOMACH AND OESOPHAGUS.

By Fred B. Lund, M.D., and John A. Foley, M.D., Boston.

Hemorrhage from the stomach and oesophagus forms an interesting and important subject for study. Upon a correct diagnosis of the cause, important indications for treatment often depend. Hemorrhage from the oesophagus is here considered together with hemorrhage from the stomach, because such hemorrhage if profuse may result in the vomiting of large quantities of blood, the blood first running from the oesophagus into the stomach and being ejected by vomiting, or, as in Case 2 of this paper, a slow hemorrhage may take place from a small dilated oesophageal vein, the blood gradually leak into the stomach and be passed into the bowel to a sufficient extent to cause a high grade of anemia, without at any time accumulating in the stomach to an extent sufficient to cause vomiting of the blood. It is partly to call attention to this fact that this paper is written. A more important point which this paper is intended to bring out is that profuse hemorrhage from gastric ulcer may in certain cases be best treated by transfusion followed by immediate operation, without long period of waiting, attended by the danger of a recurrence of hemorrhage, which was undoubtedly advisable in the period before we had transfusion as a method of putting our patient quickly in good condition, and before we understood the use of the cautery as a simple and comparatively safe method of treating bleeding superficial ulcers.

It is a curious fact that profuse vomiting of blood comes from two widely different causes, the actual rupture of a varicose vein in the oesophagus, a cause in which we can readily understand the hemorrhage must be profuse, and a diffuse oozing from one or more very superficial ulcerations, abrasions, or "weeping surfaces" in the stomach. Anastomosis of blood vessels in the submucous tissues of the stomach, with the accompanying marked vascularity of its mucous membrane is the reason that these superficial ulcerations bleed so freely, and fill the stomach with blood so fast that vomiting in large amounts occurs. These hemorrhages from the abrasions in the stomach occur usually in young women, the ulcerations are rapid and acute and get well quickly under rest in bed and bland diet. These are, as a rule, best not operated upon. A hemorrhage which is merely the first symptom of gastric ulceration, nevertheless may be so profuse as to strongly suggest rupture of an oesophageal vein. It is a curious fact that such profuse hemorrhages occur from such dissimilar causes as rupture of an oesophageal vein and oozing from a superficial ulceration. Rupture of an oesophageal vein, however, usually occurs in older patients, and is attended by symptoms of more or less advanced cirrhosis of the liver.

The following case illustrates the fact that cirrhosis of the liver may be the cause of profuse, even fatal hemorrhage from the stomach in a young girl, without previous symptoms of cirrhosis of the liver.

Case 1. A well developed, well nourished Jewish high school girl of fourteen years of age was admitted to the service of Dr. E. H. Nichols at the City Hospital on November 18, 1919. Previous history unimportant. She came home from school early one afternoon complaining of nausea and during the ensuing night vomited large amounts of bright blood six times. Entering the Hospital at 3 A.M., she was found quite blanched and with an extremely weak and rapid pulse. She continued to vomit blood, and at 2 P.M. on the next day hemoglobin was 37% and the white count 1,300,000.

A transfusion was done, but the veins in the arm were found to be too small to get the tube into, and the saphenous vein had to be used. This also was very small. Only about 100 c.c. of blood could be gotten to run in. The patient died at about 6 P.M., and the autopsy showed a large spleen (695 gm.), cirrhosis of the liver, and varicose veins surrounding the lower end of the oesophagus, one of which, just at the cardia, was shown by injections of methyline blue to have been ruptured. "The surface of the liver showed numerous pea to walnut-sized, round masses and there were dilated veins in the liver."

The veins in the oseophagus are prominent and tortuous, averaging the diameter of a goose-quill. By means of methylene blue injection of these veins a minute leakage is discovered in one of the veins exactly at the point where the oesophageal mucous membrane abruptly changes to the cardiac type of gastric mucous membrane.

The second case reported in this paper is reported to illustrate the fact, which has never been previously called to the writer's attention, that hemorrhage from a small ruptured vein in the oesophagus may be so slow as never to cause vomiting of blood until it has gone on so long as to produce a fatal anaemia. The underlying cause of this condition was a carcinoma of the pancreas, so small that it was noted by of the writers during a careful exploration made at the time of the removal of the gall-bladder, and was not noted at the autopsy until sections were made of the pancreas.

Case 2. P. T., aged 53, a fireman, was admitted to the City Hospital on November 18, 1919. History unimportant until five months ago, when he began to have indefinite pains in the abdomen, chiefly the lower left quadrant and right hypochondrium. Suffered from constipation. The pain was not sufficient to keep him from work, but was not relieved by medicine

Examination showed a man with well developed musculature and healthy appearance, showing slight tenderness in the epigastrium and right hypochondrium. Bismuth x-rays of the gastrointestinal tract were negative, but the x-rays showed the outline of an enlarged gall-bladder. Under the diagnosis of cholecystitis he was operated upon November 21. The gall-bladder was found to be much distended and tense. A careful palpation of all the intra-abdominal organs at that time showed no abnormalities. The pathological report was chronic cholecystitis. The patient had hiccough for a couple of days then did perfectly well until December 5, when he was allowed to sit up. On the 8th of December he was attacked with nausea, vertigo, rapid pulse, became quite anaemic and passed a tarry stool. On the 9th, his symptoms continuing, a transfusion was done. On the 11th, his pulse and temperature were normal. On the 13th, he expectorated amounts of dark brown fluid, and on December 14th and 15th these symptoms continued. On December 16, he vomited a small amount of bright red blood. He became very much weaker, the abdomen became much distended, and a transfusion was done. Feeling from the amount of blood he had passed in the stools and from vomiting a small amount of blood that there must be an ulcer of the stomach that had been overlooked at the previous operation, I opened the abdomen again and found many adhesions around the former position of the gall-bladder. The abdomen was filled with dark colored serum. There was a good deal of hemorrhage from the under surface of the liver in separating the adhesions of the duodenum. I could find no evidence of ulcer anywhere in the stomach. The patient continued to fail and died on December 17.

The autopsy showed a very unusual condition, an oesophageal varix which was undoubtedly due to a small cancer of the head of the pancreas At autopsy almost all the viscera had been removed from the abdominal cavity before anything abnormal was seen, when a section of the pancreas showed slight enlargement of the head of the pancreas with increased consistency. In the tail of the pancreas was found a ring of normal pancreatic tissue, about which were several small areas of white, translucent tissue. Sections nearer the head showed invasion of the pancreatic substance by this foreign tissue which in the tail of the pancreas surrounded the parenchyma. Section through the pancreas at a point midway between the head and the tail showed islands of normal pancreas infiltrated by smoother, paler tissue which on examination proved to be carcinoma. The splenic vein and the branches of the mesenteric vein at this point showed friable thromboses. The thrombosis of the splenic vein extended throughout the length of the pancreas and into the portal vein. Section through the head of the pancreas showed an increased amount of the tumor tissue, which had infiltrated the pancreas very extensively. The oseophageal veins were somewhat dilated. In the cardiac end of the stomach on the posterior surface about 3 cm. below the cardia, a pin-point area of hemorrhage in the wall was found. Injection of the veins near this area failed to show a communication with the blood vessels. Certain of the veins in this region were thrombosed. This illuminating autopsy showed thrombosis of the splenic veins and ulceration of the stomach close to the oesophagus due to thrombosis of the varicose oseophageal and gastric veins. It showed that the dilatation of the gall-bladder was due to a growth in the head of the pancreas which was infiltrating, but not large enough for me to feel at the operation. The special point for which it is quoted, however, is that a gradual hemorrhage from such a growth could go on for days or weeks or months without at any time being sufficient to cause vomiting of blood. As causes of profuse hematemesis from the stomach we have discussed in the foregoing paragraphs, oesophageal varices and oozing from superficial ulcerations.

The third important cause is erosion of a large blood vessel by deep chronic ulcers. This may be the proper place for a brief discussion of hemorrhage in chronic ulcers. Gross hemorrhage from the mouth is a comparatively rare symptom in chronic gastric and duodenal ulcer, about 20% (Eusterman). A steady, slow, slight (often very slight) escape of blood goes on constantly which may be noted by examination of the stools. The reason for this is that never being poured out in sufficient quantity to cause vomiting, it is passed on into the bowel and may go on sufficiently to produce marked anaemia (as in Case 2 of this paper).

In ulcer the reason that the bleeding is usually slow is that the ulcer after eroding the mucous membrane down to the muscular layer presents a firm anaemic base which does not bleed. After this condition is reached, the only bleeding is from the narrow edge of eroded mucous membrane, where the latter joins the base. This hemorrhage in the acute stage, when the erosion concerns only the vascular mucous membrane, and when no scar tissue was formed, is apt to be much more profuse. In deeper ulcers, reaching to the submucosa, the anaemic scar tissue of the base ordinarily does not bleed at all, and that from the edge is most of the time, slight. When increased hemorrhage does occur from such an ulcer, it is probably due to erosion of a blood vessel, large or small, in the spreading border of the ulcer. This intermittent hemorrhage is characteristic of ulcer as compared with cancer, in which as would be expected from the rapid growth and more rapid breaking down the hemorrhage is apt to be more constant and profuse. When a chronic ulcer perforates and becomes adherent, however, it may invade a very large vessel, e.g., in the pancreas, and a profuse and even fatal hemorrhage be the result.

In the earlier portion of the paper we have discussed the reasons for the comparatively excessive hemorrhage from acute ulcers of the stomach as compared with the chronic ulcers. It is my firm belief that these acute ulcers are the early stages of an ulceration which goes on and becomes chronic, though many writers do not believe that this is the case. The following discussion regarding treatment applies to the treatment of severe hemorrhage from all forms of stomach ulcer, but in particular to acute or small ulcers which cannot be seen or felt on examination of the outside of the stomach after the abdomen is opened.

*Treatment.* When confronted with a case of vomiting of blood sufficient to cause an acute anaemia the question of treatment comes up. Surgeons are generally and rightly agreed that operations on the stomach are best not done in the presence of shock from great loss of blood. In acute cases the ulcer may heal while the stomach is kept at rest in the treatment of the first hemorrhage, so that the bleeding is never repeated. In chronic ulcer there has been a generally accepted dictum that after a second hemorrhage one should operate. This may be a good working rule, but it is also a fact that the second hemorrhage may be fatal. I have myself seen several young women die of a second hemorrhage from an ulcer under the waiting treatment and under this plan we have no assurance that the patient is not being weakened by a constant steady oozing which is being passed out into the bowel, and is surely not improving the patient's ability to endure an operation should such be necessary.

The use of an actual cautery in operations for ulcer has greatly simplified the treatment of hemorrhage and made it much safer than before, while transfusion furnishes us with a ready means of changing a patient at once from a bad to a good operative risk. It seems to me safer to transfuse and operate at once and cauterize the ulcer, than to wait the doubtful result of a second profuse hemorrhage. But in order to cauterize the ulcer we must at first find it, and we well know that superficial ulcers can sometimes not be seen or felt through the stomach wall from the outside. They can be found by passing the wall of the stomach in review, so to speak, through an opening in the anterior surface, and Rovsing and Herrick have devised instruments resembling cystoscopes for looking around the interior of the stomach through a small opening in the wall. The presence of the "sentinel gland" to which I had the pleasure of calling attention about twenty years ago has often aided me, as in the cases described below, to find an ulcer. It was found by my own observation and the much more extensive one of the Mayo Clinic that the presence of a single enlarged gland in the mesentery might be a guide to an ulcer situated opposite to it along the greater or lesser curvature. A positive x-ray, if we have one, may also aid us in the location of the ulcer.

I wish to report briefly two cases in which such ulcers were located by the sentinel gland, aided in one by the x-ray, transfusion done, and apparent cure effected by the use of the cautery through an incision in the anterior gastric wall.

Case 3. A woman of 41 was admitted to the Boston City Hospital on December 1, 1919. Fifteen years ago she had vomited blood and was told that she had an ulcer. At this time she remembers distress after eating and other symptoms pointing to ulcer. Since then she has had attacks of epigastric distress off and on, usually following indiscretions of diet. Because of this distress after eating she came to the out-patient department and had a bismuth series. These were negative and she was sent home on a diet. Two days later she had a hemorrhage of about one pint of blood and came back to the hospital. Another bismuth series gave a report of gastric ulcer high up on the lesser curvature. She had another severe hemorrhage and was transferred to the Surgical Service. Examination showed a well developed, poorly nourished woman, pale and anaemic, with a pulse of 144. She presented a scaphoid abdomen with some resistance and tenderness on palpation over the epigastrium. In view of the fact that the patient had repeated gastric hemorrhages and severe anaemia, operation was advised. Before operation, however, a transfusion was done, using the left arm of the donor and the right arm of the patient. The Kimpton method was used. 650 c.c. of blood were transfused. She immediately improved and the pulse dropped from 140 to 100. Her color was good. At the operation an epigastric incision was made and the stomach raised into the wound and closely examined. No induration could be felt, but there was an enlarged gland in the gastrohepatic omentum close to the lesser curvature opposite the point at which the x-ray showed a constant deep incisura rather high up on the lesser curvature. The stomach was opened and this area examined from within. It showed a small bleeding ulcer not very deep, having a base of white scar tissue about half the size of a ten cent piece. The ulcer was burnt out with the cautery and the resulting perforation inverted and closed by a double row of chromic sutures. The patient made a first-rate recovery, recovered from her anaemia and quickly regained her weight and strength. An x-ray taken after the operation shows the constricting effect of the scar in the stomach, but the patient's condition and freedom from symptoms leave little doubt of a cure of the ulcer.

Case 4. A young man of 18 was admitted to the Boston City Hospital on January 31, 1920. He stated that he had always been well except for indigestion and poor appetite, which he had had for as long as he could remember. The day before entering the hospital, while he was working, he suddenly became dizzy, nauseated and vomited up a large quantity of dark-colored blood, he thinks about half a bucket full. Immediately after vomiting he had rather severe pain in the epigastrium. The next day a physician gave him medicine and told him to remain in bed. In the afternoon, however, he got up and walked around the house. Suddenly he became nauseated again and vomited up more blood. The pain again became severe and he was sent to the hospital. Examination showed an anaemic, thin, poorly developed and nourished boy, evidently in severe pain and spitting up streaks of dark colored blood. There was extreme tenderness over the epigastrium, no spasm, abdomen not tympanitic, normal area of liver dulness. Pulse was extremely rapid. The diagnosis of bleeding gastric ulcer was made on the history of nausea and indigestion with recent vomiting of large quantities of blood, tarry stools, and anaemia with physical signs presented by the abdomen. The next day a transfusion was done by Drs. Gallupe and Sullivan with the patient's brother as donor. The Kimpton direct method was used. The veins in the elbow were exposed and the patient given 500 c.c. of blood. He was very comfortable for a short time following the transfusion, with pain in the abdomen which was controlled by morphine. He had not vomited since entrance. Operation by Dr. Lund under ether. High mid-line incision. The stomach was brought into the field and carefully explored externally. There was a sentinel gland in the gastro-hepatic omentum about one-half inch from the lesser curvature just above its centre. The stomach was incised and a superficial ulcer, bleeding constantly, with no induration surrounding it, was found on the posterior surface opposite the gland. The bleeding area was cauterized carefully until bleeding ceased. The incision in the stomach wall was sutured with Young's intestinal catgut, the abdomen was closed in layers and the patient given saline solution per rectum while on the table. He made a good ether recovery. He was rather restless, complained of pain in the abdomen and vomited a very small amount of blood which had probably escaped into the stomach during the operation. His anaemia improved and there was rapid increase in weight and strength. He left the Hospital March 3, in fine condition.

The writers believe that immediate transfusion and cauterization of the ulcer are preferable in cases of this description to waiting, attended as it is by the constant danger of repeated hemorrhage followed by an exhaustion which may be fatal.

Bibliography.

Massive Hemorrhages from the Stomach without Demonstrable Ulcer. Alexis V. Moschcowitz, M.D., Am. Jour. Med. Sci., 1916, clii, 714.

Profuse Recurrent Gastric Hemorrhage, with Report of Cases and Description of an Instrument for Viewing the Gastric Interior at Operation. Frederick C. Herrick, M.D., Cleveland Med. Jour., 1911. Vol. x, 969, Dec.

Hemorrhage from the Stomach and Duodenum. William J. Mayo. Collected Papers by the Staff of St. Mary's Hospital, Mayo Clnic, Rochester, Minn., 1905-1909. W. B. Saunders Co. 1911.

Diagnostic Value of Blood or Hemorrhage in Gastric and Intestinal Lesions. Clinical and Statistical Study. George B. Eusterman. Collected Papers by the Staff of St. Mary's Hospital, Mayo Clinic, Rochester, Minn., 1913. W. B. Saunders Company. 1914.

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# LACERATED WOUND INTO KNEE-JOINT, TREATED BY COMPLETE CLOSURE AND IMMEDIATE ACTIVE MOBILIZATION.

By Lyman Allen, M.D., Burlington, Vt.

The report by Dr. Willems of Belgium on 100 consecutive cases of open injury to the knee-joint, with and without sepsis, and with and without foreign bodies in the joint or its neighborhood, with his remarkable results as regards mortality and mobility, is probably known to you all. Of these 100 consecutive cases, 18 were accompanied by a purulent synovitis of a virulent type, chiefly streptococcus. There were no deaths and no amputations; one resection and two stiff joints. His figures were doubted at first; they were too good to be true, but as other army surgeons copied his methods more or less accurately their results approximated his.

The principle which he employed in the treatment was new—active motion from the very first, repeated every two hours day and night, a radical departure from the former treatment of immobility in joint injuries. Surely most, if not all, of us have used immobility in our treatment of joint injuries of all kinds, and ankylosis, or limited motion, was frequent if not the rule. I can think of some classes of joint cases where I used active or passive motion to a very moderate degree, such as the strapping and immediate use of a moderately sprained ankle or knee. Also for many years our athletes have been treated by massage and immediate active and passive motion for joint injuries of all kinds, with the result that in most cases they have been able to resume their athletics long before they could have under the treatment by splints, and with usually good results. I have always felt that the trainers and the athletes themselves took a chance when they did this, preferring to run the risk of a poor result rather than face the certainty of a long convalescence, but apparently they were following the best line of treatment.

From our earliest college days the idea of *rest* for injured tissues has been drilled into us. We immobilized a fracture because we wished it to unite in a given position, but we immobilized an injured joint although we wished it to get well *without* union of the joint surfaces or formation of strong bands of surrounding connective tissue. Not very logical, was it? The idea behind it all was "rest." "If you want any tissue to get well quickly, give it rest." But in joint injuries we forgot that what we feared was not lack of healing but ultimate limitation of motion.

The presence of sepsis adds another factor—to combat which we need good drainage and hyperemia. Both of these are secured by motion, active better than passive. There is little hyperemia in a joint strictly confined by splints—and what can force pus out of a joint capsule so well as active motion with an adequate drainage opening? Undoubtedly our treatment of joint injuries has been much influenced by the type of joint disease most frequently seen in civil practice, *i.e.*, tuberculosis. Here we have a chronic disease which *rest* tends to cure—one which may remain latent for years and break out again from the slight trauma of motion; and our aim is to secure ankylosis, for this reduces the likelihood of future trauma by preventing all motion. True we occasionally see the cure of a tuberculous joint *with* motion, but all such joints are constantly menaced by the possibility (yes, likelihood) of the re-awaking of the trouble by some slight joint strain, so that the tuberculous joint cured by ankylosis is a safer "joint" than one cured (probably temporarily) with some motion. We have let our experience with tuberculous joints which we hope to cure *with* ankylosis, direct our treatment of acute joint injuries, which we hope to cure *without* ankylosis.

The case I wish to report came to the Mary Fletcher Hospital January 5, 1920. I had had an unfortunate experience shortly before with a bullet wound in the knee-joint of a young man, which I treated in the old way, removing the bullet, débridement, drainage and splint, only to have the patient die with streptococcic infection. The reports of Dr. Willems' cases determined me to try his method at the first opportunity.

"S. Mc.," aged 5, fell and struck his right knee on a broken bottle frozen in the ice, making a jagged cut about three inches long to the outer side of the right patella, laying the joint open from the patellar tendon upward and outward. He was 40 miles away and his physician telephoned that he was bringing the child to the hospital and asked what should be done as first aid. I told him to paint the wound and neighborhood with tincture of iodine and put on a sterile dressing. About five hours after the accident, under ether, I enlarged the wound slightly upward and outward; picked out all clots, trimmed all the cut edges and washed out the joint with 2% boric acid solution, using several quarts, keeping my fingers out of the wound entirely. No broken glass could be found in the wound and I closed the synovial membrane with No. 00 interrupted catgut; sutured the capsule with interrupted No. 2 chromic catgut and medium Kangaroo tendon; closed the subcutaneous tissues and skin with No. 00 catgut and continuous silkworm gut and a few interrupted silkworm gut stitches; carried a small cigarette drain down to the capsule and painted with tincture of iodine. Light sterile dressings were put on with knee flexed and then extended so that motions could be kept up. The nurses were instructed to make the child flex and extend his knee to the full extent every two hours day and night, and to use passive motion if he refused to move it himself. Cigarette drain was removed on third day and silkworm gut sutures taken out on the ninth and tenth days. Healed by first intention. At first the child was much afraid to move his knee but soon he found that it was not painful and we made up a game which encouraged him to move it actively.

He was in bed eight days, never used a crutch or cane, went home on the twelfth day and has an absolutely normal joint.

Under date of September 30, 1920, his mother writes: "The condition of Stuart's knee is perfect so far as we know. He has never had any pain in it and uses it as well as the other. He hasn't limped any since March 1 and could run then as well as he can now. We are more than grateful to be able to make this sort of a report. Yours truly, Mrs. C. J. McC."

It seems to me that the principle of Dr. Willem's treatment of knee-joint injuries may well be carried over to the treatment of injuries of other joints.

When a fracture so complicates the joint injury that active mobilization cannot be carried out without the displacement of fragments, we must use a splint, but in sprains and dislocations without fracture, active motion seems to be indicated. Even a dislocated shoulder or hip will not easily recur after reduction unless the particular motion which caused the original dislocation is repeated and carried to an extreme, and with a sprain there is no such danger. It is a common saying that a bad sprain takes longer to heal than a fracture. May that not well be due to the formation of fibrous adhesions which limit the motion of the joint and which have to be stretched out later in convalescence. They could not have formed at all if full active motion had been carried out from the first. Where motion is limited by effusion into the joint, Dr. Willems aspirated (perhaps repeatedly) and found each time that motion was at once restored. This certainly could be done in other joints than the knee.

Perhaps it may be said that our results in sprains and dislocations are good enough under our old methods—but are they really? I know several old sprains and dislocations where the motion of the joint is far from normal. The results are not so bad as the average in knee-joint injuries treated by immobilization, but they might be better.

Who shall say that if the knee-joint when injured by penetration, injury to capsule, cartilage and bone, and perhaps complicated by sepsis, can be made to give 97% of movable joints and no deaths under active mobilization —as was done by Willems—that we should not dare to treat the ordinary closed sprain or dislocation by similar methods?

In conclusion, let me say that I realize that one case proves nothing at all, but when a radical departure is made from the ordinary methods of treatment it should prove helpful if each of us should report every case, whether success or failure. To me it seems certain that Dr. Willems has made a tremendous contribution to surgery.

### DISCUSSION OF DR. LUND'S PAPER.

**Dr. Daniel F. Jones**, Boston: The question of how to treat bleeding from a gastric ulcer has always been an interesting one. We were first urged to operate at once upon all bleeding ulcers, then we were urged to wait until the patient had recovered from the single severe hemorrhages. Joslin and Greenough showed that in a large series of cases treated medically, the mortality from severe single hemorrhages was almost nothing. Repeated small hemorrhages require operation before the patient's condition becomes too bad to permit operation. Now Dr. Lund urges us to transfuse and operate at once.

To know just what to do in these cases of hemorrhage, always seems very difficult to me, as it is hard to wait when a patient is bleeding. It would take very little persuasion for me to follow Dr. Lund's advice. I am sure, however, if we got to operating generally for hemorrhage from the stomach, we should be losing many patients. It is the small, deep ulcer which most often bleeds and I know from experience that these ulcers are hard to find even when we use the "sentinel" gland as a guide. I have recently operated upon two of these small ulcers which had bled and found them with the greatest difficulty, even with the aid of the x-ray. They were very small and deep, situated just on the duodenal side of the pyloric ring, on the posterior wall. If these patients had been in poor condition I believe that I should have overlooked them in my haste to finish. In the large chronic ulcer, it is much better to operate when the patient is in good condition for the proper treatment of these cases is usually very difficult.

Rupture of varicose veins or ulcerations near the cardia, mentioned by Dr. Lund, cannot be found by operation and therefore operation should be avoided in such cases.

I have, perhaps, been fortunate in not losing any patient that I have had to watch because of hemorrhage, and probably my turn to lose some is coming. I feel certain that I should have operated unnecessarily and should have lost some of these patients if I had operated at once.

**Dr. F. B. Lund**, Boston: I would like to say one word in regard to what Dr. Jones said. I don't believe in operating on a patient in shock from gastric hemorrhage. The only point is that if you transfuse them you may transform them into a good operative risk, and then if you cauterize the ulcer you are able to get better results than if you leave them to medical care. I can't give figures, but I have seen a number of young women die from a secondary hemorrhage when they were trying to get over a primary one. Transfusion makes the patient into a good risk, and the use of the cautery makes a simple operation, and if we can avail ourselves of these in any given case, we are possibly giving our patient a little better chance than if we trust to luck. Of course, Dr. Jones said he has never seen a case die of hemorrhage. I have, as stated above, seen patients die of a secondary hemorrhage while waiting to get into condition from the first one. Now that is the kind of thing we want to avoid.

**Dr. D. F. Jones**: I would like to ask if these cases of hemorrhages are from very small ulcers, and if he does not feel that if they are put on a very strict diet in those very small ulcers there is not a good chance.

**Dr. F. B. Lund**: I think there is, but the healing of ulcers by diet is a very slow process, and there will be periods when they will start up again. Now if you cauterize them first and turn them in and then put them on the diet you are safer.

**Dr. R. B. Greenough**, Boston: In 1899 Dr. Joslin and I studied one hundred and eighty-seven cases of gastric ulcer at the Massachusetts General Hospital. There were seven cases of fatal hemorrhage in this number—five males and two females. In no case did a young woman die of acute hemorrhage, and in practically all of the cases it was the repeated hemorrhage from the chronic ulcer in older persons which proved fatal.

Dr. J. S. Stone, of Boston, read a paper on "The Treatment of Epiphyseal Separations."

### DISCUSSION OF DR. STONE'S PAPER.

**Dr. Seldom B. Overlock**, Pomfret, Conn.: To a man who has about one hundred and fifty boys from eleven to eighteen years of age under his care for nine months of each year, who are constantly receiving injuries in their various sports, this paper appeals strongly. Several points occur to me suggested by Dr. Stone's paper. One of these is this: there seems to be an impression that epiphyseal separation rarely occurs after fourteen or fifteen years of age. In fact, it occurs quite frequently up to eighteen or nineteen years. If I am wrong in this, Dr. Stone will correct me.

Another thing is in regard to rotation. The cases in which this is not recognized and corrected are those in which function is not fully restored later. It is always well to have an x-ray picture of the opposite side as well as of the one injured. By comparing the two pictures an injury can often be discovered that might have been overlooked otherwise.

### DISCUSSION OF DR. ALLEN'S PAPER.

**Dr. F. B. Lund**, Boston: I have been very much interested in the report of that case. I have seen so many bad knee results from immobilization and in compound fractures and also in septic infection that I agree with Dr. Allen that this method is a great addition. I reported a case of gunshot fracture where the joint was opened and motion from the first instituted and the man got a good result. Since then I have had a patient with a wooden leg and septic infection of his only good knee. When I saw him his temperature was 104° F., and pus in the joint and I immediately opened it and began immediate motion after washing out the joint with salt solution. He was a very hard patient to get to move his knee, but he kept on moving it more and more and drained pus for six days, and after that a little serum. It soon healed up and the man has a perfect knee, which is a surprising thing in the light of my former experience. I agree that we ought to try this and report results.

**Dr. David Cheever**, Boston: In view of what Dr. Allen suggests, I might mention a case that was under my observation last spring. The patient was a boy, eight years old, who fell under a truck and received an extensive lacerated injury of the lower legs, a great deal of the skin and soft tissues were stripped from the bones without a fracture. The whole field became septic, and he had a streptococcus septicemia and incidentally he had a purulent effusion of the knee-joints so that both joints had to be opened and drained, and a positive culture of the streptococcus was obtained from each, and that boy made a practically complete recovery under the treatment which Dr. Allen has advised. It took months of constant, frequent, active and passive mobilization after drainage so that the case is different from Dr. Allen's in that both joints were involved and a culture of streptococcus was obtained. Whether there was a bacteriemia I am not certain, but I think there was.

**Dr. Alfred M. Rowley**, Hartford: I presume the secretary put me down for a discussion of Dr. Allen's paper, knowing that I had had some experience in joint surgery during the war. We all know with what pessimism many surgeons looked upon penetrating wounds of the knee, and we know that surgery made two great advances during the war: first, in surgery of the chest, and second, in surgery of the joints. It is difficult to drain the knee or even to flush it. Some attempted this by cutting and suspending the patella tendon and then irrigated with Dakin's solution. It was not until late in 1917 that we started to treat knees by motion. The operative procedure was a debridement using lateral incisions, then flushing the cavity and closing the capsule, leaving the skin open. If there was no infection of the skin as shown by culture, it was closed, and the knee was put in motion. Flexion of the knee-joint was a great aid in making a diagnosis of an intracapsular wound, as it would pump the blood out at the point of penetration. With lateral incisions and motion the joint is kept freer from pus than in any other method of drainage.

I will cite only two cases—one a penetration wound with articular damage. This man had no infection. Was walking and discharged from the hospital in ten days. The other had a comminuted crushed fracture of the patella. He developed a mild infection of the joint. After two weeks I went in and broke up all the adhesions and closed over the skin and put him into motion. I have had a letter from him since, stating that his joint was as good as a hinge. In infections, motion oftentimes is very painful and it is sometimes very difficult to get these patients voluntarily to manipulate the joint. I think this treatment has made a wonderful advance in joint surgery and particularly so in those cases that keep sterile.

**Dr. Lyman Allen**, Burlington, Vt. (closing): It seems to me that Dr. Willems proved his treatment in injuries of the knee-joint; and reports of other men, some of them using modifications of it, do not reach his results. His results are better than those of any modification.

As regards motion: As soon as motion is established it diminishes pain. The patients who have kept their joints moving have less pain. Active motion is better than passive; passive is better than nothing.

About closure of the joint: Close the joint, and if you have to take out a suture later for drainage, do it; but never put a drain into the joint. Drain down to the capsule in suspicious cases. In a septic joint you get hyperemia and drainage from motion; rest will not give you hyperemia and will not *drain it*.

What I want to bring out is this: Why not treat other joints in a similar way? Why not take a dislocated humerus and reduce it and give it some active motion, but not the motion that threw it out? Why not do it? Let us carry that principle over. I say, if the knee-joint having been penetrated, will stand active motion and give us 97 per cent. of movable joints, why can't we take a simple dislocation and with active motion get better results than we have in the past?

Dr. A. M. Rowley, Hartford, read a paper on "Goitre; Features in Operative Technic and Results" (from Ms.).

Dr. David Cheever, Boston, read a paper on "Are There Reliable Criteria of Operability in Exophthalmic Goitre?"*

### DISCUSSION OF DR. ROWLEY'S AND DR. CHEEVER'S PAPERS.

**Dr. Frank H. Lahey**, Boston: I am very sorry not to have been here to listen to Dr. Rowley's paper, but I have been very much interested in Dr. Cheever's, and with a few exceptions I agree with everything that Dr. Cheever has said. I presume that Dr. Rowley took up the subject of anesthesia, which I believe is an extremely important one in connection with operations in hyperthyroidism. Anesthesia, I believe, in my own experience, has played an important part in lowering mortality. I believe the ideal anesthesia in the surgical treatment of hyperthyroidism is one which gets the patient to the operation with the least degree of stimulation and the one which gets the patient back to bed with a narcosis which persists as long as possible.

I originally began thyroid surgery with ether and then changed to local anesthesia, but local anesthesia is entirely wrong, if there is anything wrong in excitation of these patients. I, therefore, added to it scopolamine and morphine. I thought it would be an ideal anesthesia combined with local anesthesia. Unfortunately it is not constant in its effects. One patient comes to the operating room awake and another sleeping, and the one that is awake is aroused and excited on the slightest stimulation. Therefore, I added gas-oxygen, and now my method consists of novocaine, scopolamine and morphine in doses of 1/200 grain and 1/4 grain two hours before the operation, and the same dose repeated one hour before the operation. The patient is then brought to the operating room and placed on the table as quietly as possible, and anesthesia with gas-oxygen is started. Gas-oxygen is, I believe, an ideal anesthetic when administered by an expert, but a very dangerous one in the hands of amateurs.

From the clinical point of view the condition of vagotony and sympathicotony is so intangible that I see no value in it. I do not mean to discourage an attempt to group cases, but as yet I have been unable to do so to any satisfaction. I talked with Dr. Means some months ago concerning the vagotonic cases, and have considered it in my own group of cases, but cannot see that they are more serious than the ones grouped in the sympathicotonic group.

We have found an operating room chart an extremely valuable means of predicting the patient's outcome. We take patients who are very seriously ill to the operating room, where Dr. Sise makes an operating chart; their pulse, respiration and blood pressure are taken every five minutes and recorded on the chart. If they are extremely toxic and we fear a fatal outcome, they receive gas-oxygen anesthesia for perhaps fifteen minutes to raise their pulse and blood pressure to the maximum, and we do not operate on them but put them back to bed and observe the effect on them of this anesthesia, and following that, if the condition is favorable, they return to the operating room in a few days. We feel that we can do a single pole ligation with very little more added load. Single pole ligation has an exceedingly valuable effect, provided you have tied the whole pole. Many ligations consist of ligations of the anterior division of the artery and vein only. If they stand the ligation of one pole, you can wait and see how they react to that; and then proceed with other ligations. So that in extreme cases one eventually has the chart of their visit to the operating room for first pole ligation, second pole ligation, and then for the ligation of the right inferior thyroid artery and then the left, and finally you have five operating room charts indicating the patient's ability to stand the various surgical procedures. Given the metabolism rate and change in weight after ligation, the operating room chart and the clinical course following ligation, we feel quite certain that we can predict the outcome in these cases.

I have now personally operated on over five hundred thyroids, and I believe that with each additional group I have gained something in the way of experience. It is an intangible thing to speak of—experience—and I do not know of any other way we can describe it except as judgment, but one does get definite impressions by observing patients with hyperthyroidism and by watching the way they react, and I believe it is of inestimable value in predicting outcomes in these cases.

**Dr. David Cheever**, (closing): I am very much pleased to find that Dr. Lahey's views coincide with mine. The pre-operative ordeal is what I meant when I spoke of the morale of the patient. Any of the injections, by quinine and urea or by iodine and glycerine or boiling water, or multiple cauterizaton, constitute the same sort of thing.

I am interested in the question of associated visceral disease, in which I do not wholly agree with Dr. Lahey. It has not been my experience that associated disease, except myocarditis, is an important factor. Not one of these cases which I quoted showed any disturbance of renal function or of hepatic function: but I am not referring to the effect on the heart.

Just another thing I want to suggest as to the use of the word "toxemia," which was brought out in a talk with Dr. Cannon. "Toxemia" means a toxin circulating in the blood. Is thyrotoxicosis a real toxemia? That is, does the thyroid elaborate toxins? The thyroid presides over the cell metabolism, but is there any evidence that the thyroid elaborates toxins?

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* Published in Archives of Surgery, January, 1921.

If there is poisoning, those poisons are presumably elaborated in the course of the normal chemical processes in the cells, and as far as I know, there is no evidence to show that there is a defective elimination of the normal toxic products of cellular metabolism, so that the question is to be considered whether what we call toxemia is not the vastly increased physiological action of the thyroid gland and not a true toxemia.

## Original Articles.

### PROSTATIC TROUBLES FROM THE PRACTITIONER'S VIEWPOINT.*

By Richard E. Dickson, M.D., Holyoke, Mass.

In preparing this paper I have hunted through my records for cases which will illustrate the common history of the usual prostatic disturbances we are called on to consider, and will detail them briefly, instead of going over the usual textbook descriptions to which we all have access.

A few years ago, J. L., 20, came to the office with complaint of full, burning feeling in the perineum, marked tenderness at defecation, frequent, very urgent desire to void, prostatorrhea noticed when he strained at stool, and he thought he detected considerable in his urine on standing. He denied gonorrhea, admitted marked masturbation,. was one of those fellows who seem to get lots of enjoyment mooning over erotic fancies, and also was doing more or less protracted courting of a moral maiden, at which times he got more than usually passionate, without relief. Between times he was decidedly melancholic and depressed, and this had been helped along very nicely by the attentions of one of the "lost manhood" quacks of a neighboring city, who had started to "cure" him, at so much a course of treatment; the course stopping for a repetition of the fee often enough so that he was somewhat discouraged, and quite sure he was well along towards perdition. Examination showed some prostatic tenderness and fulness, no spermatazoids in his prostatorrhoea, so that he was told that he had a simple hyperemia, urged to omit his self-abuse, his courtship, and to occupy himself with something real in life, and was given a mixture of bromides and saw palmetto. He got along nicely for a while, then his mental depression got the better of him, he floated back to his "lost manhood" adviser, and shortly after hunted up a good deep hole in a country brook and drowned himself.

Not long since I was called to the home of N. C., 28, single, an ardent admirer of free and easy women, and whiskey with a kick, who was complaining bitterly of a severe pain of sudden onset in perineum and rectum, aggravated by fruitless attempts to void; temperature 101, pulse 112, generally used up, but in all having only one urgent demand, to get rid of that water, and so his pain. A hurried palpation of his prostate showed it decidedly enlarged and very hot and tender. Later inquiry developed the fact that he had recently had a gonorrhea and had been consuming considerably more whiskey than he needed. All attempts to catheterize were negative, both without and then with an anesthesia, so I aspirated, getting out a good lot of urine, and then put him to sleep with a hypo of morphine and hyoscine, with hot packs on bladder and perineum. Some hours later, under general anesthesia, a friend and I succeeded in getting a catheter down through the urethra, which was anchored there for a while. With the pushing of diuretics and sedatives, and plenty of heat locally applied, in a few days he was able to take care of himself, first with a great deal of dysuria, then difficulty in retaining his urine before he recovered. In this acute prostatitis I considered that we were extremely fortunate not to get any abscesses forming in the tissues, a fairly common sequel and calling for evacuation through the perineum unless there be spontaneous evacuation through the urethra. Also we were equally fortunate in not poking any false passages along the line of the swollen, tender tissues.

J. M., 47, married, no gonorrheal history, another alcoholic, had a retention with much the same history of rectal and perineal pain as above, and called another physician, who got into the bladder with a catheter, bringing out considerable urine, followed by marked bleeding and a good deal of suffering. As soon as the other medic had left the house, the patient decided with considerable vigorous blasphemy to change doctors, and I was the unlucky victim called right away. I found him in a great deal of pain, and some "fussed up," so he got enough morphine and hyoscine to give him several hours of rest, and as there was still some bleeding when I got there, ice bags to perineum and over bladder. Some hours later, after cleaning him up, I got a mild solution of cocaine and adrenalin deep into the urethra with an urethral syringe, and after a little coaxed a catheter down into the bladder without any repetition of the bleeding. Rest in bed, alternating heat and cold, saw palmetto and santal with lots of liquids, fixed him up after a time. He has twice since returned for treatment, as soon as he discovered he was getting the least bit of prostatic tenderness, and each time putting him to bed, giving him the mixture I used at first with plenty of heat to the perineum, has staved off any catheterization. I am in hopes that a fairly strict enforcement of the Volstead Act will prevent his getting what seems to be an exciting cause of his trouble.

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* Read before the Eastern Hampden Medical Association, at Springfield, Mass., June 10, 1920.

Turning now to chronic prostatitis, I am convinced that we find this much more frequently than any other prostatic condition, and that many of the prostatic troubles late in life are acute exacerbations of a chronic prostatitis rather than an hypertrophy, in the sense we usually employ the term. While, like the acute, it is more or less a sequel of gonorrhea, it has a variety of other causes.

B. E., 65, married, no history of gonorrhea or alcohol, at present under observation, for some time back complained of frequent desire to void, worse on lying down, with marked difficulty in retaining his urine if he got into a place where he felt he could not void, as his automobile with a company of ladies or elsewhere under observation. He has more than once said "Damn" during the fall, on finding his front door latched when he got to it, and being unable to get the door open and reach the toilet before he wet his trousers. Early in the winter, due to the exigencies of a large business, he found himself getting overtired and noted that he voided more at night and had more trouble in retaining than usual, that he was getting considerable dull perineal pain, and also pain referred to lumbar region and to rectum, scrotum and urethra, at times so serious as to inhibit sleep, while I was about to have him x-rayed for renal or ureteral calculus. Shortly complete retention supervened. I catheterized him three times in thirty hours without difficulty, then he resumed normal voiding, gradually lost all his pain and discomfort by substantially following the treatment I spoke of in acute prostatitis, *i.e.*, rest, diuretics, sedatives, external heat, etc., and since his recovery two and a half months ago, has rejoiced in his improvement, now being able to retain or void as he wishes much more than for some time, is also possessed of sexual vigor which had been in abeyance previously, which he is advised to forget. In commenting on this phase of referred pain, Young speaks of several cases he attempted to operate in pre-x-ray days, when he was sure he would find stone in kidney or ureter, but which turned out apparently to be only a reflex from prostatic irritation.

S. W., 22, single, dissolute son of wealthy old people, came to me some time since with the calm assurance that he had had several "doses," all of which had been cured, but that he found himself troubled with seminal losses at stool, and, after he was at all sexually excited he had hard work holding his water till he could get to a toilet, otherwise he was comfortable. He occasionally had a protracted session with an accommodating female, which was followed in a few hours by complete retention, with a great deal of perineal and urethral pain and tenderness, he would be obliged to be catheterized for several times, then would subside, and be normal till he had another experience, when he repeated his retention, etc. He was advised to change his manner of life and devote himself to something besides gratification, which he agreed to do and then forgot. After several repetitions of the above, he moved to another part of the country, and so passed from observation.

Chronic prostatitis either follows an acute attack, or is secondary to a posterior urethritis or a cystitis. The predisposing causes are ungratified excitement, excessive coitus, masturbation, hemorrhoids, habitual constipation, or various irritating conditions of the urine, the exciting cause an infection. Young advises systemic prostatic massage, either manual or by mechanical vibrator, at intervals of from three to ten days, followed by urethral and bladder irrigation with some soothing solution, as a mild boroglyceride, assuring the man of the need for patience, and keeping at it until the congestion has subsided. Of course there is a group of chronic prostatics with chronic abscesses, etc., requiring surgical care, but these are not in the limits of this paper.

In symptomatology, tuberculosis of the prostate strongly resembles chronic prostatitis, except that a careful palpation shows a more nodular condition, often more tender than prostatitis, and the diagnosis hinges on finding T.B. in the secretions expressed from the prostate. If ulceration occur, hematuria and eventually a serious condition of the parts follow, with grave prognosis. Persistent hygienic treatment, with carefully regulated doses of tuberculin seem to offer the best results. Later, if no good comes from these, drainage has helped.

Abnormalities and cysts of the prostate are to be considered when unusual structures are found, but are of sufficient rarity to warrant omission in a paper of this type, as is also true of sarcoma.

T. B., 65, married, a New York dentist, who often visited his people in Holyoke, with a history of various genito-urinary troubles at intervals for some years, so that he was more or less under observation of one of the New York urologists, came to me about two years ago with a history of just having had a pretty bad time in a New York hospital where he had gone for a cystoscopic examination, which he thought had mutilated him, this having been done during the absence of his own physician. He had then a great deal of haematuria, with pain in penis, scrotum, perineum and lumbar region, which he said had grown progressively worse during several months. He was then voiding without help, but had had various periods of retention. Palpation showed the prostate to have a feeling of marked hardness, and it was quite nodular. Always frail, his increasing infirmity soon caused his return home, where his urologist refused operation, simply trying to let him down easily, and in a few months he was dead from carcinoma of the prostate. About six months before this, his sister, older than he, had died of cancer of the breast, and a year later a brother, ten years older, also died of cancer of the prostate, up on a Vermont farm.

Merritt, of Atlanta, reported two cases of prostatic calculi in the *Journal of the American Medical Association* for December 20, 1919, which sum up the textbook descriptions so well that I have inserted them here:

A, 25, white, unmarried, without venereal history, noticed four months before consultation burning sensations while voiding, worse at termination, occasional haematuria. Strenuous exercise gave marked pain in perineal and pelvic region. Nocturnal emissions were frequent, always followed by severe pain and increased voiding. He feared intercourse because of pain afterwards. Examination showed prostate slightly enlarged and so very tender that it was impossible to express any prostatic fluid. Cystoscopic examination showed a normal anterior urethra, a contracted, tender posterior urethra, an enlarged, inflamed veru montanum. X-ray examination showed a small shadow in the median line of the prostate. Operation removed a small stone, after which patient was free from any symptoms.

B, 44, white, married, with gonorrheal history twenty years before. Ten years before began to have occasional dysuria, with frequent perineal and pelvic pains, gradually increasing in intensity, greatly aggravated by constipation and straining at stool. No hematuria. Intercourse impossible because of pain following. Physical examination showed a similar prostate, and the cystoscope a similar condition of urethra and veru montanum. X-ray showed a small shadow in median prostate line. Operation removed eighteen small calculi, since when patient has been normal. Injuries of the prostate divide themselves naturally into two classes, contusions and wounds. The first arising from kicks or blows upon the perineal region, or in a similar way from horseback or bicycle riding, inducing an acute prostatitis, with the treatment already outlined. Wounds may be the result of war, as from bullets, spear or sword or dagger; from falling astride sharp projecting objects, from false passages made with sharp metal catheter; and surgical wounds. The blood supply to the prostate is sufficiently rich so that there may be a most troublesome hemorrhage resulting, with its consequent worries. Clean wounds usually heal promptly, hence, to insure as much cleanliness as possible, and to control bleeding by packing, should be the plan. Infected wounds, unless freely drained, are apt to give a cellulitis, and may give a peritonitis, hence free drainage is in order. Fortunately the gland seems to be more tolerant than some parts of the body, and often the wounds of false passages heal spontaneously. If not, and abscesses result, they get the same treatment as elsewhere, evacuation and drainage.

Any reference to prostatic troubles naturally turns our thought to hypertrophy of the prostate, the condition most commonly seen by us, which I have brought in here, rather than right after chronic prostatitis, to which it bears many elements of similarity, but which no less an authority than Young advises does not follow chronic prostatitis as an immediate sequel. The most common lesion is an increase of both lateral lobes, and also of the median lobe or bar, by a thickening of the covering capsule and an increased growth of the glandular substances composing the lobes, thus distorting the urethra. The median lobe has been found as large as an orange, sometimes pedunculated, making a regular ball valve to the urethra; or sessile, making a decided kink in the urethra. More rarely the middle lobe alone, or one or both of the lateral lobes alone enlarge, in either instance disturbing normal voiding by the compression or twisting of the prostatic urethra.

J. D., 58, married, without venereal history, noticed that he was voiding at night with some frequency, a new experience, as he had never had any urinary trouble, but that in the daytime he was normal as always. In due time he found that he was unable to void on arising, but that he must stir about, and that the stream was gradually becoming smaller, and also that he saw that he was obliged to strain considerably, with very little result, though after a time he thought he was emptying the bladder with less than normal control, as incontinence developed. Hot sitz baths helped for a little, but ere long the catheter was employed, and he was soon convinced that the incontinence was only a result of overfilling, and that he always had residual urine except when withdrawn by catheter. Notwithstanding attention to asepsis, the patient doing his own catheterization, a cystitis developed, considerable pus and blood showed in the urine, digestive disturbances made their appearance, vesical calculi were formed and conditions went on from bad to worse. Operation was advised but declined. At length consent was gained, a Bottini was done by a New York man, who also put in a perineal drain, in all his manipulations failing to discover any calculi and positively declaring none present. The patient got no relief in any curative sense, the bladder drain of course keeping down any bladder distention, uremia soon developed, and death ensued. Autopsy showed a rather small prostate, with sufficient middle lobe fulness to inhibit voiding, a handful of vesical calculi, the bladder and left ureter much distended and filled with pus. The history extended over three years.

W. B., 77, previous history negative, was confined to his home one January, some years since, with a severe bronchitis. One of his neighbors, of convivial habits, having visited a source of supply and gotten properly loaded, drove into B's yard on his way home, pitched out of his sleigh and forward, so that the horse on stepping around, which he didn't do, would have stepped on the driver's head. B. saw all this, and was so excited by his neighbor's peril that he rushed out to where he had fallen, not stopping to remember that he was partially dressed and had been confined to the house for some time, and with great effort, for the booze fighter was a heavy man, pulled him out of danger, roused him sufficiently to get him into the house, and together they got back in. That night B. could not void, try as he would, so I was called and to my surprise no catheter that I had or could get, would go in. The prostate did not feel unusually large, (but of course rectal palpation is useless in determining the size of the middle lobe); it was not specially tender, but it was certainly blocked all right. I aspirated suprapubically, getting 18 ounces. During the next ten days, through which time he was kept in bed as his general condition was made worse by the exposure, external heat applied, sedatives given, and catheterization attempted, his only relief was a daily aspiration. At the end of that time the urethra being sufficiently open to get in a catheter, for a few days the bladder was emptied every eight hours. He then resumed normal voiding, and had no further prostatic trouble.

J. P., 79, single, had the usual history of nocturia, then slowness in starting his urine, with diminished force, then retention and catheter life for ten days or so, recurring about every six months, usually spring and fall, for the last six years of his life, each time suffering greatly from excessive vesical tenesmus, and also marked pains in back, thighs, hips and rectum, with disordered digestion, constipation and marked hemorrhoids. He was financially very well off, but hated to spend a cent, and so because of the extra expense he refused to be catheterized oftener than night and morning, suffering torments several hours each day, which might have been avoided by a six-hour interval. His bladder usually contained about 750 c.c., or a pint and a half, as much as I've ever happened to find in any of my cases, though Young reports a case where he got about 4500 c.c., or about nine pints. Each time, after the ten days interval of suffering, his gland subsided sufficiently for normal voiding, and he would become as comfortable as anyone. He had an apoplexy one night about four months after his last prostatic attack, due to an effort to save himself from falling when he tripped, and was dead the following morning.

S. W., 83, married, gave a history of some years of catheter life at intervals, with very little attempt at even ordinary cleanliness, washing his soft rubber catheter as convenient, and carrying it, with a jar of vaseline, in a cloth in his pocket, to have it handy as needed. While he had some cystitis, considering his lack of asepsis, he was very much more comfortable than many for whom all precautions were taken. He finally got to worrying about his condition; fearing lest his passage should close so that he couldn't get the water out, he requested operation and the gland was removed by the suprapubic route. For days it looked as if he might die at almost any moment, but he recovered and lived for five years or so, dying of a broncho-pneumonia.

I might go on with case histories, but what has been given illustrate the essentials of the conditions.

With this gland as with other organs of the body, the best prophylaxis seems to lie in seeking as normal a life as possible. The seduction of the "skirt" seems to promise great things to the young man in his vigor, but in proportion as he yields, good old Dame Nature seems to charge it up, and later in life may give him some pretty serious occasion for thought as, in one way or another, she puts a kink in this unimportant little gland which causes the gentleman afflicted to lose all interest in the rest of his anatomy, until the trouble is allayed. While I have been very much interested in the operative methods and results recorded, they are not a part of this paper, and so will not be detailed.

# THE DIAGNOSIS OF SOME CHRONIC SHOULDER INJURIES.

By William Pearce Coues, M.D., Boston.

It certainly would be denied by few who have an adequate knowledge of the subject that chronic shoulder injuries and their proper interpretation form one of the subjects where perplexities concerning diagnosis and treatment are numerous and at times baffling.

The last usually severe winter, 1919-20, has been responsible for a considerable increase in this class of cases.

Those cases without obviously clearly defined fracture of bone form the very large group which I refer to in this connection.

To make an accurate diagnosis in these cases and to think of what is the best thing to do for them, is a problem with each case. Cases where a sub-deltoid bursitis is diagnosed often are much longer in getting well than a case of frank and definite bone injury about the shoulder, that is, presupposing treatment with a minimum amount of fixation, and early massage and passive motion. Less obvious solutions in the continuity of bone about the shoulder joint are often missed, particularly if no radiographs are taken. Such cases fall into the group of the so-called sprain, or insertion fractures, described by Callender and Stuart. Some slight bony injury is present in many cases of so-called traumatic shoulder bursitis. Of the injuries about the shoulder without gross bony injury, subdeltoid bursitis is one that is surely accountable for more disability, loss of time, and general discomfort, than any other lesion.

I believe, in these cases coming on after trauma that there is always a definite damage near the bursa, tearing of the bipenniform deltoid fibres, and that the bursa is a secondary manifestation. Strains of the supra-spinatus tendon as well as tearing, frequently accompany this lesion. Tears of the tendons of the latissimus dorsi and teres major tendons also occur not uncommonly. Usually in these cases we have a history of the arm being suddenly fixed in forced abduction with some circumduction; it is then that tendons give, and at times muscle bundles also. The after history of these cases reminds one strongly of that of epicondylitis, or tennis elbow. In each case there is usually stripping and tearing of periosteum, from excessive tendon pull. We see the cases usually some weeks or months after the original injury. Though some men have said that treatment at this time, other than operative (in necessary cases), does little, if any good, I am positive that systematic baking, massage, and exercise does do great good in some cases. The question of hysteria after shoulder injury is a very important one, to which comparative little attention has been paid. It is hard for the examiner to believe and always have in mind the fact that a robust and muscular workman not infrequently suffers from a purely hysterical shoulder, long after the physical effects of his injury have passed away. In examining these different types of shoulder cases, those without any obvious and striking features regarding deformity and in some with apparently little loss of function, there are certain points which, if followed carefully in routine, will enable us to arrive at a correct diagnosis in most cases. In obtaining a history, it is important to ascertain as accurately as possible the story of the accident. We must ascertain if there was a fall, a blow, or whether injury followed muscular violence alone. From these points we may often in our own minds hazard a thought as to the probable diagnosis. Always inquire if there has at any time been any previous injury to the shoulder. It is wise always to inquire as to the patient's history with reference to previous Neisser or spirochaetal infection. This should never be neglected, particularly in the sub-acute and chronic cases, as it may have a very important bearing on the outcome. In the examination, it is important to have all clothing removed to the waist, so that an unrestricted view of both shoulders is obtained. In many cases, care has to be used in doing this, for the comfort of the patient.

In the acute cases seen some hours or days after the trauma we naturally proceed somewhat differently than in the older cases. Begin by inspection. Much may be learned before the shoulder is touched. Note the amount of swelling, if present, the situation of any ecchymosis, and the manner of support of the injured part. Make the patient go through shoulder and arm motions with the uninjured arm. This gives us a good idea of the arcs of full motion. Find out just what the patient can do with the injured side. Next proceed to careful palpation. Rotate the humerus gently and note the result. Palpate the acromion and coracoid regions, ascertain if the line of the humerus seems straight. If a patient after an injury to the shoulder can perform all shoulder movements well, even though there is some localized pain, the chances of a fracture of bone, a bursitis, or serious shoulder tendon injury is very remote. In subacute and chronic cases, it is important on inspection to note any visible atrophy. Inspect the shoulder region from the back as well as the front. Note the hand grip, and condition of the hand and fingers. The cases in this class are almost always either subdeltoid bursitis, with or without shoulder tendon injury, fracture of the great tuberosity of the humerus, or hysterical shoulders. Cases of true arthritis of the shoulder following injury are certainly, in my experience, rare.

It is at times impossible to be sure, without the aid of radiographs, whether we are dealing with an old fracture of the greater tuberosity without displacement, or a subdeltoid bursitis, or both. In late cases, bony thickening about the tuberosity may clear up the diagnosis. With negative x-rays as regards fracture, we can make a diagnosis of a bursitis from the typical clinical picture of painful restricted abduction, tenderness over the upper deltoid, and free motion on swinging the arms forward, which Codman has so graphically described.

Hysteric shoulders occur quite commonly after injury, men being affected as well as women. Sometimes they occur after trauma which was definitely too trivial to cause such symptoms as are afterwards complained of, and sometimes they follow a definite injury, as a bursitis. The recognition of the hysteric element is important. After seeing and recognizing a few of these cases, one can suspect the probable nature of the trouble when the patient first steps into the office or clinic. Many times we find the arm and shoulder swathed in flannel and bandages, and the greatest care is taken in removing them. The mental attitude of the patient often gives us a clue. They complain bitterly of pain before the shoulder is touched, and have suffered many things from many doctors. On examination they often resent the lightest touch, though it would be impossible for it to cause pain. The shoulder is usually held immovable, the hand hanging at the side. Any movement of the elbow, humerus, or shoulder as a whole is resisted. The patient will not move the part actively at all. There is usually no atrophy of muscles, and nutrition of the arm and shoulder is good. Despite the great pain, the patient usually eats three good meals a day. In performing the simple test for sensation by pin prick, we find total anaesthesia of the shoulder, arm and hand, together with anaesthesia of the back and chest to the middle line in many cases. Such findings with no atrophy, and the characteristic attitude with lack of any bony lesions, make the diagnosis practically positive. Sensation tests should never be neglected in the examination of chronic shoulder cases, as without them many cases are overlooked, and a definite traumatic condition is diagnosed, when we have to do with pure hysteria.

The following case illustrates some of the points touched upon in the preceding pages:

Case 1. M. M., a man of 65 years, was seen for the Massachusetts Industrial Accident Board, on December 26, 1919. The history was that on December 6, 1919, as he was throwing heavy stones into a cart, he twisted his right arm. Since this time he has been bothered by pain, stiffness, and disability of the right arm and shoulder. He was treated by massage and external applications and later a radiograph was taken which was said to be negative for fracture. There has been inability to use the arm for work since the accident. There was no previous trauma to the arm.

Examination showed no obvious atrophy of the shoulder or arm. The grip was somewhat weak, but the patient could close his fingers well into the palm. The bony landmarks of the shoulder were in normal relation, but there was a distinct fullness over the anterior part of the shoulder. There was tenderness to pressure over the anterior shoulder region, but no crepitus or abnormal mobility was detected. All shoulder motions saving adduction were restricted with considerable muscle spasm. Pain on abduction was marked, and the arm could not be raised to a right angle with the body. Sensation was unimpaired.

Clinically, the picture seemed typical of a traumatic subdeltoid bursitis. X-ray examination showed a fracture through the greater tuberosity of the humerus, without displacement.

Case 2. G. M., a remarkably muscular and well-developed man of 32, was examined for the Board on December 31, 1919. The history was that he was struck on the left shoulder by a bale of cotton on December 2, 1919. He suffered immediate pain in this region, and stiffness and disability has persisted so that work is impossible. The shoulder was immobilized for a short time, but no radiograph was taken of the injured shoulder.

Examination of the shoulder showed no obvious atrophy. The hand grips were the same, and there was no disturbance of sensation. The bony landmarks of the shoulder were in normal relation, there was no abnormal mobility or crepitus detected. The shoulder motions were restricted, but mainly abduction of the humerus, which was painful and restricted to a right angle from the body. There was a tenderness to pressure over the anterior aspect of the shoulder, but it was not very marked. X-ray examination showed a fracture through the greater tuberosity of the humerus without displacement.

Case 3. Mrs. M. G., was examined for the Board on December 10, 1919. The history was a long one, and dated back for some years. In March, 1914, she was struck on the right arm about the middle third, by a shuttle which weighed about twelve pounds. She was in a cast for three weeks. After this, a course of massage and baking was given, which was kept up for nine months. The arm remained painful and stiff and has remained so. The patient has been unable to do any work since the accident. She says she feels no strength in the arm or hand and has nearly constant pain around the shoulder. She cannot dress herself, and has to take medicine when the pain gets unbearable.

Examination showed a well developed and nourished woman, 71 years of age. There had been no previous accidents and the health had been good up to the time of the accident. The right arm hangs stiffly at the side. Any attempts to move the forearm, elbow, or shoulder provoke exclamation from the patient. There is no grip with the right hand. The thumb is extended and the fingers are semi-flexed. The bony landmarks of the elbow and shoulder are in normal relation. No attempts at passive motion of the arm are allowed. There is no atrophy of the shoulder, arm, or forearm noted, and the skin is in good condition. No attempts at active motion of the arm and shoulder will be made. There is no thickening detected about the humerus. When the patient's attention is distracted by inquiries about her injury, palpation and slight passive motions are possible. Sensation––There is a total anaesthesia to pin prick over shoulder, arm, forearm and hand; anaesthesia is present to the midline in the back down to the line of the dress. There was also anaesthesia to mid-line on the chest, which was not quite so definite.

X-ray examination shows no present evidence of an old fracture of the humerus, and nothing wrong in the shoulder region. At the time of examination there was no wrist drop, nor was there any history of its occurrence. Nevertheless, some time before the diagnosis had been made of musculo-spiral paralysis secondary to injury of the humerus. Such histories and findings as the above are not very uncommon, and it so happens that personally I have seen fully as many of these hysteric manifestations after previous injury in men as in women.

Syphilis plays its part in the etiology of obscure shoulder conditions as well as in other parts of the body. Trauma may at times cause a localization of the specific process, as has been so well pointed out by Churchill in his work on luetic bursitis.

The following case illustrates a phase of the subject. This might well have been ascribed to repeated slight trauma of work, if certain examinations had not been made.

Case 4. D. G., laborer, 26 years old, was seen at the male surgical clinic, Massachusetts General Hospital. There was no history of trauma beyond the use of his shoulder in his daily laboring work. Six days ago his shoulder became sore. He was unable to raise his arm above the horizontal. Sometimes it can be raised higher, but with great pain. There is steady pain in the shoulder, radiating down the back. No history of injury. Examination showed shoulder motions limited, especially abduction. Much pain on attempt to raise arm above shoulder. No crepitus elicited. Marked tenderness over the right acromio-clavicular joint. Slight swelling of the shoulder. April 16, 1920, Wassermann report, strongly positive. X-ray examination of the shoulder shows definite variation from the normal, at the outer end of the clavicle. The process is in the upper surface, and involves the periosteum and soft parts, and is almost entirely proliferative. There was no bony atrophy. Trauma, periosteal sarcoma, and gumma of the outer end of the clavicle were considered in the x-ray diagnosis. The clinical findings, together with the positive Wassermann, left no doubt as to the character of the trouble. How much the repeated use of the shoulder in laboring work had to do with the localizing of the process about the right shoulder, is an interesting and complex point to decide.

The question of brachial plexus injuries, after trauma about the shoulder, is one that must always be held in mind. Particularly after fracture of the clavicle, even long after, bony points may cause pressure on the plexus leading to muscle atrophy and disability of the shoulder. Many incorrect diagnoses are made in such cases.

To sum up: We find that subdeltoid bursitis, with injury to the supra-spinatus tendon, unrecognized fracture of the greater tuberosity of the humerus without much or any displacement, and hysteric shoulders form a large part of the general group presented for examination. A careful study of each individual case will usually lead to a correct diagnosis. The treatment of such cases often consumes much time, and patients are easily discouraged, but from our study, we feel that most of them are restored to full work in time.

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The next annual meeting of the Massachusetts Medical Society will be held in Boston, Tuesday, May 31, and Wednesday, June 1, 1921.

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# FRACTURE DISLOCATION OF THIRD CERVICAL VERTEBRA.

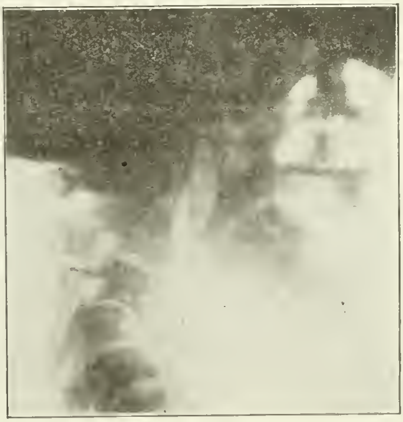
By Louis A. O. Goddu, M.D., Boston,

*Orthopedic Surgeon to Out-Patient Department of Massachusetts General Hospital; Chief Orthopedic Surgeon to Woonsocket Hospital.*

*History.* Patient injured October 27, 1919. Struck by a bag of wool, hit him in the back of the neck. Patient thrown to floor. Lost consciousness. Revived—found left arm completely paralyzed. Two days later—right arm became paralyzed. Had a great deal of pain in back of neck and left shoulder the first few days. Patient taken home in ambulance. Remained home in this condition for four weeks.

*Examined* by writer on November 26. Patient had both arms extended along side of body, slightly claw shaped position of fingers; unable to move arms at all but could move terminal phalanges of both hands. Respiration about 45 per minute. Some difficulty in breathing. Was not compaining of any pain. Head motions restricted, particularly laterally. No grip in either hand. Reflexes present but diminished, especially in the left arm. Moderate atrophy of muscles, most about the shoulders on the right, well marked on the left. Sensation on left side of neck, on left shoulder and on left side of chest, to level of second rib was diminished. No pain in lower limb. No changes in reflexes.

*Diagnosis* made of partial crush of cord with some hemorrhage into ventral horn into left side particularly; edema of cord from compression Diagnosis—fractured dislocation. X-ray—"Forward dislocation of third cervical vertebra on the fourth."



*Problems* presented in this case seemed to be as follows:

1. Reduction of dislocation.

2. Consideration of what actual disturbance had occurred in cord to give symptoms. Also what part hemorrhage and the edema played in the production of the symptoms.

In considering the first problem, the question of reduction, one had to weigh very carefully the fact that this man, a heavy robust individual, had lain more or less passive on his back and whether or not the giving of an anesthetic might not produce a hyperstatic pneumonia; also whether or not interference would produce a greater trouble with the phrenic nerve which was already involved and embarrassing his breathing.

It seemed to the writer that the problem of an actual replacement four weeks after the injury would be asking too much and such an attempt under an anesthetic either with an open operation or manipulation without an open operation would be fatal. Therefore the following method of treatment was decided upon: Head traction was applied, a six-pound weight attached, and this kept on night and day for three days, when a judicious forcible manipulation in the proper direction in an attempt to reduce some pressure symptoms was made. This manipulation immediately changed the rate of respiration. In another 48 hours another manipulation was given. At this time patient stated that the neck felt better and things were different there. The next day, the patient was able to use right arm with a little bit of help; the effort was there, but the muscles were weak.

Examination December 10. Right arm showed fair strength in fingers, forearm, and hand and weak movement in abduction of the arm from the side and of the external rotators of the humerus. On the left side, the grasp, movements of the fingers, wrist, pronation and supination and extension at the elbow were fair, though weaker than on the right; and flexion at the elbow, abduction and external rotation were a mere trace.

January 7, or little over four weeks after patient's entrance to the hospital, patient was up and dressed. Note on that date states, "Patient is up all day long, feels grateful for his recovery, can use arms in all directions, strength in both arms steadily improved and there is every reason to expect a fairly good return of function."

Patient all this time had been having baking and massage. It would be well to state that an ordinary Thomas collar was made and traction was taken off at the end of the third week. The collar was worn night and day and then a permanent collar of leather and steel made to be worn till such time as the fractured bone would become firm.

The prognosis would seem to be that the patient would have limited rotation of head and both arms; would recover practically normal strength except a slight weakness of the left deltoid.

It would seem this case illustrates the necessary careful treatment in these cases and even with important anatomical reposition such as above x-rays illustrate; but with pressure relieved, return of function is possible and the writer feels reasonably sure that had more radical procedure been done he would not have a patient to tell the tale.

First x-ray taken November 26, 1919, by Dr. Butler:

"There is a forward dislocation of the third cervical vertebra on the fourth. There is no fracture."

(Signed) P. F. Butler.

Second x-ray, taken December 15, 1919:

"There is a dislocation forward at the third cervical vertebra on the fourth. The angulation at the site of dislocation is less marked than at the previous examination. There is also more space now between the third and fourth vertebra, thus relieving the pressure on the cord."

(Signed) P. F. Butler.

From these two reports it can be seen that there was sufficient manipulation to change the relation between the third and fourth vertebral bodies and one cannot help but feel from the subsequent quick reaction in the patient's condition that the manipulation plus traction had a decided effect in this patient's future in making him a useful member to society.

At present writing, November twenty-third, this patient is able to work. He has unusually good motion of both arms in all directions, the strength is a little less in the left arm. On the whole, the man has a remarkably good return of function and is able to be a useful member of society. He has practically full use of both arms and has only slight limitation in rotation and lateral bending of the head.

## Clinical Department.

# BENIGN GROWTHS OF THE STOMACH. REPORT OF TWO CASES.

By A. S. Merrill, M.D., Boston,

*Assistant Roentgenologist, Massachusetts General Hospital.*

Malignant growths of the stomach are all too common, and every roentgenologist has frequent occasion to observe and study their characteristics which in most cases are typical, and with the clinical history and physical findings form a pathognomonic picture.

There are a few of the rarer forms of gastric tumors not often enough seen to study fully their characteristics and differentiation from the more common forms.

Excluding local inflammatory indurations, hypertrophic thickenings, varicoses, aneurisms and other thickenings accompanying or following local or constitutional disease, several forms of primary benign growth of the stomach have been noted and reported by various observers. These include polypi, adenomata, lymphadenomata, myomata, fibromata, myxomata, lipomata, osteomata and cysts.

These benign growths are of great surgical and pathological interest. Infrequent, of unknown cause and atypical clinical course, their diagnosis and differentiation are imperfectly known. They are undoubtedly very rare although many probably pass unrecognized or are missed through lack of operative or post-mortem opportunities for observation. They may take their origin from any of the gastric layers. They may remain confined to the structure of their origin or invade other layers. Their form is variable; flat, rounded, nodular or pedunculated. They may be single or multiple. They may occupy any portion of the gastric wall.

Balfour reports one case of polyposis in the Mayo clinic in 69,000 abdominal sections including 8,000 gastric lesions. Tigler found fourteen benign gastric tumors in 3,500 autopsies. Versé reports fifty-five cases of polyp in the digestive tract, four occurring in the stomach. Ebstein reports fourteen polyps of the stomach in 600 autopsies and cites eight from the literature. Of these twenty-two, twelve were solitary. Fenwick in thirty-four cases found 41% solitary. Mentrier classified these tumors in 1888. Meyer in 1913 reported a case diagnosed clinically. Stoner in 1914 made an excellent report of a case diagnosed by him. He says that single polyps are usually near the pylorus and discusses at some length the theories of their cause and origin. He finds that nearly all occur after middle life. All, except two, that came to his knowledge were more than fifty-nine. One was thirty-four and one, thirty-six.

Of the different varieties the mucous polyp is perhaps the most common. Ebstein found fourteen in 600 autopsies. Fenwick in his "Cancer and Other Tumors of the Stomach" finds these to comprise 0.2%. Their etiology is obscure. They have been thought to arise from various chronic irritations of the mucosa although the same factors are rarely found common to several cases. Whether the accompanying catarrhal condition is an etiological factor or a sequel is a disputed question.

The adenomata contain more gland elements, frequently of an intricate and branching structure and appear more closely associated with malignancy. Rarely one meets tumors having all the characteristics of malignant adenomata physically, but of apparently benign structure on pathological examination. Pitt (Tr. Path. Soc., London, 1889), Lange (N. Y. Med. Jour., 1892) and Ferguson report cases. The histological differentiation is difficult and often questionable.

The lymphadenomata are overgrowths of normal lymphoid tissue and are usually found associated with systemic lymphoid increase.

Myomata are generally small and may be single or multiple, pedunculated or mural. The former are said to be found generally in the pyloric end while the latter are more often in the media or near the fundus. Von Erlach, Von Eiselberg and Kunze report large ones from 251 to 4,500 gm. in weight.

Fibromata, single or multiple, are usually found near the pylorus. It is claimed that they are never primary growths but forms of scirrhous carcinoma, fibrosarcoma or fibrous growths on the site of old ulcers.

Lipomata are rare and usually solitary. Of myxomata only three cases have been published. Osteomata are really calcareous deposits in degenerating fibromata or sarcomata. Cysts of several varieties have been described, the most common being retention cysts. Balfour's case, reported last year, was diagnosed by Carman by the peculiar radiographic and radioscopic appearances.

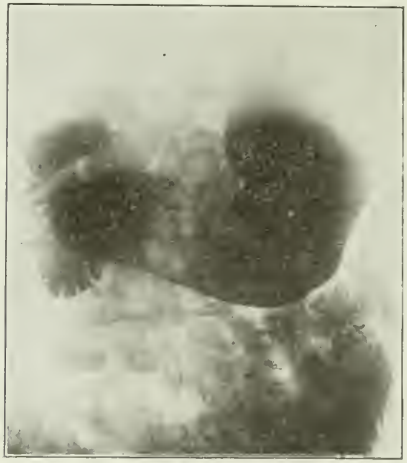
Two cases have recently come under my observation in the clinic at the Massachusetts General Hospital which seem worthy of report.

The first, a case of pedunculated benign tumor, was referred for gastric study because of vague symptoms of weakness and a secondary anaemia of unknown cause, rather than any definite indications of stomach trouble.

I. E. A white man of 73, of excellent past health, complained of gradually increasing weakness beginning about two years ago. At that time he had influenza and pneumonia with good recovery except a persisting loss of strength. Not weak enough to stop work. Appetite good. No nausea, gas, epigastric pain, vomiting, hematemesis, abdominal distress nor icterus. No diarrhea; bloody, tarry nor clay-colored stools. For six or seven weeks noticed swelling of the legs and feet more marked during the day. No oedema elsewhere. During the same period he noticed a sensitiveness to cold at night. Entered hospital to find cause of weakness.

Gastric analysis—Fasting, 10 c.c. thick mucoid, blood streaked. No food particles. Test meal, 5 c.c. watery, blood tinged. Food particles. Free HCl, 0. Total acid, 0.

Blood examination—R.C., 4,064,000. Hgb., 70%. Achromia, slight poikilocytosis, rare polychromatic, increased platelets, increased transitionals. Secondary anemia.



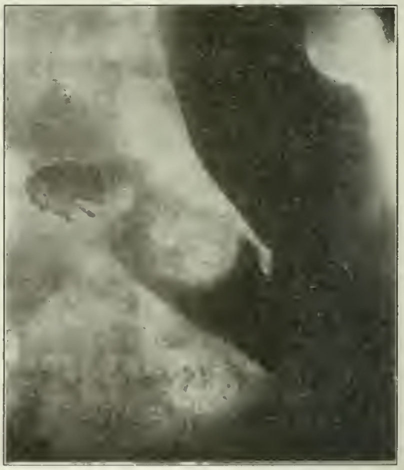
Case 1.

X-ray examination—Stomach in normal position, action sluggish, tone good, outline regular. Contained a residue of about one-half the meal at six hours. In the antrum, apparently about two or three inches above the pylorus, was a rounded, slightly mottled shadow which displaced the barium contents without completely filling the diameter of the gastric lumen. This shadow seemed to be slightly movable within the outline of the stomach, but not to any great extent. The surrounding gastric walls seemed to be soft and flexible on palpation and the peristaltic wave, though shallow, passed along the whole wall. A diagnosis of pedunculated gastric tumor, probably benign, was made.

Operative findings—"Normal sized stomach. Soft rounded mass within, smaller than a tennis ball, which proved to be a polypoid growth attached to the anterior wall near the greater curvature. Wall of the stomach not infiltrated. Liver normal. No glands. Stomach opened and growth removed by cautery."

Pathological report—"A soft purplish-red tumor measuring 3.5 x 4 x 5 cm. Its surface is rough and granular and it has a soft narrow attachment to the underlying mucous membrane of the stomach. Microscopic examination shows elongated gland tubules which are frequently branching and lined by a single layer of high columnar epithelium. There is a loose connective tissue stroma which contains bands of smooth muscle and is infiltrated with wandering cells. Large plasma cells with hyaline protoplasm are conspicuous. There is no evidence of malignant disease."

The second case, of a somewhat different type, was referred to us by her private physician with symptoms suggesting gastric trouble, but not of a severe nature or typical character.



Case 2.

A. F. A white woman of 30, in good physical condition, had for about five years felt a slight pain in the stomach followed by nausea, occurring about every two weeks. This appeared to follow exertion and was followed by vomiting. No history of hematemesis. Saw blood in stool once about three years ago. Slight gas. Bowels regular. Lost about three or four pounds in three months.

X-ray findings—Stomach was low in position. Peristalsis and tone were good. About one-half the barium meal was present in the stomach at six hours. A little above the pylorus a portion of the antrum was occupied and the barium displaced by an oval, sharply outlined, slightly mottled shadow about the size of a hen's egg. It did not present the characteristic defect of an invading growth as is seen with cancer, but was distinctly outlined by a faint trace of barium around its whole periphery. It was situated on the lesser curvature and its border on that side projected a little beyond the width of the antrum. The barium passed around it, occupying along the greater curvature about one-fourth the width of the lumen. The mass could not be displaced within the stomach by palpation. It was visible and had the same characteristics in all positions. A diagnosis of gastric tumor, probably benign, was made.

Operative findings—"Sessile tumor as big as a hen's egg, with small ulcerated depression. Granulation tissue and fibrous material. Excised"

Pathological report—"Specimen from the stomach. An area of the stomach measuring 3.5 x 4 cm. in which there was a small depression, pin-head in size, extending into its mucosa, the underlying walls of which were smooth, soft and greatly thickened. Microscopic examination showed muscle wall replaced by loose fibrous tissue which is quite cell-rich. There is hyperplasia of the mucosa which dips down. Benign tumor with small ulceration."

These cases represent tumors in the stomach of benign nature but of very different characteristics. The first should probably be classified as a polypoid adenoma, while the second has more the characteristics of a fibroma. In both there was no interference with peristalsis. In neither was there any definite involvement of the gastric wall beyond their site, and the obstruction appeared to be mechanical. They were both distinctly visible by mechanical displacement of the opaque material. Both were superficially lobulated, their lobulations giving the shadow a reticulated appearance. Both evidently bled, the first considerably.

In both cases differentiation was necessary from foreign body and food remnants, and a second observation was made to that end. One would expect more mobility in the shadow of a foreign body than was seen in these cases. In the first case malignancy must be seriously considered, but the local nature and absence of definite involvement of the gastric wall which could be well seen on both curvatures, and the slight mobility of the shadow within the gastric outline was unlike the appearance of cancer as usually seen. From malignant polyp or pedunculated malignant tumor the differentiation could be made only by the practical absence of gastric symptoms, the duration, and the slight physical impairment of the patient. The second must be differentiated from ulcer, and the shallow erosion on the surface might be a preëxisting ulcer or an ulceration beginning on a tissue abnormal in structure and of low resistance. The filling defect was atypical of ulcer.

REFERENCES.

[1] Campbell: Benign Tumors of the Stomach. Surg., Gyn., and Obstet., Vol. xx, pp. 66-71.
Journal, Vol. x, No. 12, p. 727.

[2] Carman and Miller: Roentgen Diagnosis of Diseases of the Alimentary Canal.

[3] Holmes: Pedunculated Malignant Growths of the Stomach. Am. Jour. of Roent., Vol. vi, p. 279.

[4] Stoner: Polypoid Adenoma of the Stomach. Ohio State Medical Jour., Vol. x, No. 12, p. 727.

[5] Basch: Primary Benign Growths of the Stomach. Surg., Gyn., and Obstet., Vol. xxii, p. 165.

[6] Balfour: Polyposis of the Stomach. Surg., Gyn., and Obstet., Vol. xxviii.

[7] Myer: Polyposis Gastrica. Jour. A. M. A., Vol. lxi, p. 1960.

[8] Wade: Intussusception of Stomach and Duodenum Due to Gastric Polypus. Surg., Gyn., and Obstet., Vol. xvii, p. 184.

[9] Novak: Polypoid Adenoma of the Stomach. Jour. A. M. A., Vol. lxxiv, p. 871.

[10] Lemon: Angioma of the Stomach. Med. Record, Feb. 7, 1920.

[11] Sheron: Brit. Med. Jour., 1912, Vol. i, p. 118.

[12] Pitt: Tr. Path. Soc. Lond., 1889.

[13] Lange: N. Y. Med. Jour.. 1892.

[14] Tilger: Ueber Primares Magen Sarcom. Arch. f. Path. Anat., Vol. cxxxiii, p. 183.

[18] Versé: Ueber die Entstehung den Bau und das Polypen Adenome und Karzinome des Magen-Darmkanak.

[16] Heinz: Multiple Polyps of the Stomach. Beitrage zur klin. Chir. Tubingen. Vol. xciii, No. 2, p. 223.

[17] Menetrier: Arch. de Physiol., 1888, p. 32.

[18] Winternitz and Boggs: Multiple Polypi of the Stomach. Johns Hopkins Hosp. Bull.. Vol. xxi, July. 1910.

[19] Finney and Friedenwald: Am. Jour. Med. Sci., Vol. v, No. 154 p. 683

[20] Ledderhose: Deutsch. med. Woch., Vol. v, No. 68, p. 2239.

[21] Ruggles: Unusual Gastric Polyp. Am Jour. of Roent., Vol. v, No. 7, p. 356.

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Edinburgh Royal Infirmary.—It has been announced in the *British Medical Journal* that the report of the managers of the Royal Infirmary of Edinburgh for the twelve months ended October 1, 1920, shows that the total number of in-patients increased from 12,550 to 13,320. The average length of treatment was 24.05 days. In addition to the cases treated in the wards, 48,117 out-patients, most of whom attended several times, received medical and surgical aid and such dressings and surgical appliances as were necessary. During the period under review there was an average waiting list of 889 persons. The ordinary expenditure has exceeded all previous records.

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## MATERNITY BILLS BEFORE THE LEGISLATURE.

On February 24, the Committee on Social Welfare will give a hearing in the auditorium of the State House on the two measures now before the legislature, dealing with maternity benefits. Copies of these bills and of the report of the Maternity Commission may be obtained at the State House or through any Senator or Representative. An abstract of the Commission report has been published in the Journal. Abstracts of the Spencer bill, which will be considered in the morning, and of the Commission bill, which will be considered in the afternoon and evening of the 24th, are printed below.

### THE SPENCER BILL.

The Spencer bill (Senate 162) "to protect mothers and children during the maternity period," provides that maternity benefits shall be placed in charge of the State Department of Public Health.

Any woman, a resident of the Commonwealth for a year before her anticipated confinement who applies to the Department and is found "to be without means of providing the ordinary and proper care for herself or infant or both during a reasonable period before, at, and after childbirth," is entitled to the benefits provided, without incurring the stigma of pauperism, and without publicity being giving to the aid received. The bill provides that the applicant shall receive and "must accept such instruction in general hygiene and infant care as the individual case demands, and hospital care or home nursing, or both medicine and medicinal care, and such other obstetrical care as may be necessary."

Furthermore, a cash benefit to be paid directly to the woman of not more than twelve dollars a week is provided when necessary, provided she refrains from gainful employment while this benefit is received.

The recipients of the benefits can choose her own physician and nurse, provided they agree to the fees and regulations established by the Department of Public Health. The physician's fee shall not be less than fifteen dollars for each confinement.

This statement involves the essentials of the bill. Other sections deal with administrative details.

### THE COMMISSION BILL.

The bill prepared by the Maternity Commission, which is included with the Report (House No. 1835 of 1920) provides as follows:

"The Department of Public Health is hereby authorized to provide advice, instruction and visiting nursing care to women (resident in the state for six months) during their pregnancy and confinement, and to mothers and their infants after childbirth, regardless of their financial condition."

When "any such woman is in need of aid other than that" already mentioned, it is provided that the commissioner of public welfare or the local authorities shall provide it without the stigma of pauperism.

The Department of Public Health is given authority to make reasonable rules and regulations, which must be obeyed. Nurses may be employed on full time or on part time, and in the latter case are exempted from civil service rules.

The Department is authorized to disseminate information regarding the objects of the act.

In another column the JOURNAL comments on the relation of the medical profession to these bills. It wishes to point out here the essential differences between the two bills. The Spencer bill is a measure of poor relief. It provides at state expense, nursing, obstetrical care or hospital care, and, if necessary, financial aid, to any poor woman who applies and is found, on investigation, to be deserving. The state is to pay whatever physician and nurse the woman chooses, provided they agree to abide by any rules laid down and accept the established fees. This measure is comparable to others which propose state aid for the deserving poor. It must be considered as a social and economic question, not as a medical question, unless it is shown that the provisions will so improve obstetric and nursing care as to make the matter one of medical importance.

The Commission bill is, in the unanimous opinion of the Commission, the best method of cutting down an unduly high maternal and infant mortality. This is to be done by the state furnishing to any woman pre-natal, obstetric, and post-natal instruction and visiting nursing care. Other aid of whatever sort, if found necessary in any individual case, must be supplied by the proper state or local authorities.

This bill is a health measure. The physician is not mentioned anywhere in the bill, except by implication in the clause last quoted.

The consideration of the bill involves two questions. The first is the medical question, whether the best way to cut down maternal and infant mortality is by supplying visiting nursing care. The Commission says it is because experience elsewhere has shown this to be true. The second question is political and economic. Is this visiting nurse care best supplied by the state? At this latter point many physicians balk. As physicians, we must take steps to cut down mortality if, as is directly stated in the report, it has been done elsewhere. We must accept the remedy suggested in whole or in part or suggest some other remedy which can be shown to be better. Action will be taken soon. The profession should exert some influence in the matter.

## THE DUTY OF THE MEDICAL PROFESSION IN REGARD TO LEGISLATION.

THE Massachusetts Medical Society has recently taken two important steps which we feel are in the right direction. At the suggestion of Dr. Mongan, the Joint Committee on Legislation has requested the several district societies to devote one meeting to a consideration of questions of medical interest which come before the legislature. And the Council at its last meeting appointed a special committee to study and report upon all measures, legislative or other, bearing upon maternity and infant welfare. The way is opened for the consideration from the medical viewpoint of the matter before the legislature which most concerns the physician.

These steps followed votes of the Joint Committee and of the Council, respectively, which indicated that the medical profession was very much divided as to the wisdom of supporting a specific bill recommended by the Maternity Commission of the state. Furthermore, the apparent unwillingness of a large proportion of the physicians throughout the state to answer the questionnaire sent out by the Maternity Commission was due in great part to the mixing of medical with social and political questions. It is unfortunate that all physicians did not respond. Yet on calm consideration it is clear that many who were sincerely interested in the medical aspects were deterred from giving their views on social questions about which they were in grave doubt.

The report of the Commission has established certain facts. They have found that the maternal death rate in Massachusetts is about four times as high as in the Maternity Centre established in the poorer and more congested districts of New York City, where at least one month of pre-natal care, adequate obstetrical care, and a month of post-natal care is given each patient.

These facts are very similar to those already pointed out by the JOURNAL, that the mortality is much higher throughout the state than among those women cared for as out-patients of the Boston Lying-In Hospital, where similar conditions hold as in New York as regards pre-natal, obstetric, and post-natal care.

The Commission has expressed certain opinions, the most important being that about 40% of the deaths of mothers and of infants are preventable. The following sentences from their report (p. 50, Appendix LI) strikes at the root of the matter: "Two-thirds of all maternal deaths result from one of two causes,—septicaemia or albuminuria. Such deaths may be prevented by proper care and treatment, and are practically unknown among the cases treated by the New York Maternity Centre or the Women's Municipal League of Boston." In the opinion of the Commission, these deaths bore no relation to social or economic conditions.

In other words, the problem of lowering maternal infant mortality is a medical problem and more specifically is a problem of insuring to all pregnant women adequate pre-natal, obstetric and post-natal care.

All physicians are absolutely united in their efforts to lower mortality. But there is no reason to expect that all should unite in favor of a specific law, providing that the State shall apply the suggested remedy through the employment of nurses. It may or may not prove that after full discussion and consideration, an overwhelming majority of physicians will come to favor the bill drafted by the Commission. It may prove that the consensus of opinion will swing toward a development of the various existing local hospitals and other agencies whereby they can render better service to the pregnant woman. Other plans may be suggested. The Journal does not express any opinion at present on any specific remedy for a condition which certainly demands a remedy. It merely emphasizes that the medical profession has declined to take a stand on the social and political aspect of a medical question, but that with its hands free it promises to undertake in earnest the consideration from a medical viewpoint of a medical question.

The delay which the profession has asked of the legislature will be justified either by a general support of the bill of the Commission or by constructive suggestions along other lines. In no other way can delay be justified.

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## MEDICAL NOTES.

Fiftieth Annual Meeting of the American Public Health Association.—The 50th annual meeting of the American Public Health Association will be held at New York City in November, 1921. The date which is tentatively announced is November 14-18.

It is interesting to note that Dr. Stephen Smith, the founder and first president of the Association, is now entering upon his 99th year. He is still active and vigorous and it is expected will celebrate his approaching centennial together with the semi-centennial of the Association.

The first organization meeting of the Association was held in New York City on April 18, 1872, and that is one of the reasons for selecting New York City for the celebration of the semi-centennial. Other considerations are the convenience to foreign representatives and to Dr. Smith, who lives in New York City; and especially a plan to conduct demonstrations of public health administrative methods in the laboratories, executive offices, garbage disposal plants, and similar centers of public health interest, in which New York City is unsurpassed.

It is expected to present in connection with the celebration a review of the progress of the various branches of public health within the last fifty years. The sectional programs will include: Public Health Administration, Vital Statistics, Laboratory, Food and Drugs, Sociology, Sanitary Engineering, Industrial Hygiene and Child Hygiene.

Rest House for Nurses.—A rest house for nurses who have served with the Army, Navy, Red Cross or United States Public Health organization has been opened at Bayshore by the Red Cross. The house is in charge of Miss Mabel Fletcher, a Red Cross nurse who saw service in Italy during the war, and fills the need of a place for nurses who have not recovered from the strain of duty overseas or epidemic service in this country. Nurses taking governmental vocational training courses, those being trained under the Red Cross scholarship arrangement and other nurses who wish to avail themselves of the benefits of the rest house will also be eligible. Application should be Miss Florence M. Johnson, director of the Atlantic Division Nursing Department. The house, a substantial structure with a spacious porch and grounds, will accommodate twenty-six nurses. It is situated on the main street of Bayshore, four minutes from the bathing beach and Great South Bay. An appropriation by National Headquarters of the Red Cross made the project possible.

### BOSTON AND MASSACHUSETTS.

The East Boston Medical Society.—The East Boston Medical Society held its annual election of officers on January 20. The following officers were elected: President, Dr. J. Danforth Taylor; Vice-President, Dr. S. Willard Coy; Treasurer, Dr. A. L. McLaren; Secretary, Dr. Ernest L. Booth.

Week's Death Rate in Boston.—During the week ending February 5, 1921, the number of deaths reported was 231 against 408 last year, with a rate of 15.90 against 26.32 last year.

The number of cases of principal reportable diseases were: Diphtheria, 71; scarlet fever, 78; measles, 54; whooping cough, 32; tuberculosis, 49.

Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 2; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 6; scarlet fever, 1; typhoid fever, 1; tuberculosis, 15.

Included in the above were the following cases of non-residents: Diphtheria, 3; typhoid fever, 1; tuberculosis, 3.

Encephalitic lethargica cases, 6; deaths, 3.

Bequests to Medical Institutions.—By the will of the late Miss Sarah M. Fay of Boston, bequests have been made to the following medical institutions: Waltham Baby Hospital, $2,000; Cottage Hospital, Springfield, N. S., $7,000; Boston Nursery for Blind Babies, $20,000; Thomas Morgan Rotch, Jr., Memorial Hospital for Children, $2,000; Perkins Institution and Massachusetts School for the Blind, $1,000; the Convalescent Home of Children's Hospital, $10,000; New England Hospital for Women and Children, $2,000.

## Miscellany.

### RESOLUTIONS ON THE DEATH OF DR. SAMUEL J. MELTZER.

The scientific staff of the Rockefeller Institute for Medical Research has expressed profound grief for the death of Dr. Samuel J. Meltzer. At a meeting on November 12, 1920, it was resolved: That an expression be recorded of the sense of great loss which his passing away has occasioned.

Dr. Meltzer has been associated with the institute from the time of its inception. His great learning, his devotion to medical science, his love for his fellow men continuously prompted the expenditure of his utmost effort in the causes to which the labor of the institute is dedicated. In this service he spent wholeheartedly the last sixteen years of his life, and in this service, in the fulness of his powers, he has died. He did not know how to spare himself in the devotion of his life to this great purpose.

The staff of the institute is conscious, however, not only of his service to the idea of the institute, but delights to recall the direction and purpose his inspiration gave to the development of medicine and medical research in the United States. His leadership and his contributions are second to the contributions of no other man in their significance for this generation of medical men. Dr. Meltzer's interest in humanity transcended the field of his medical activities. In the spirit of human coöperation he desired to include all men, so that there might flow, across the boundaries of nations, a desire for progress in the direction of universal ideals. These great interests were recognized, not only in this country, but in Europe as well, and gave Dr. Meltzer a unique position as a lover of his kind.

These are the thoughts which the staff desires to record. They indicate how widely the influence of Dr. Meltzer was spread, how intensely his example was appreciated here.

The staff desires to convey its profound sympathy to the family of Dr. Meltzer, and in this resolution to acquaint them with a measure of the regard in which he was held. For the staff, Dr. Meltzer has not died; by the spirit of his example, he has helped to make the spirit of the institute, and this spirit will continue while the institute endures.

## Correspondence.

### DIPHTHERIA ANTITOXIN IN CHELSEA.

East Boston, January 25. 1921.

*Mr. Editor:—*

I should like to caution brother practitioners living outside of Chelsea to carry a supply of diphtheria antitoxin with them when called upon to treat patients in Chelsea. This is my experience: It was necessary for me to use antitoxin in a very severe case of diphtheria in Chelsea, and the only place there where the Board of Health keeps a supply of it is in the Chelsea police station. I sent a boy to the station, with a note for some antitoxin, and the answer came that they have none for outside physicians. As it was rather late in the evening and very cold, and as I did not have my automobile with me, I certainly spent a busy hour begging some antitoxin from my brother practitioners of Chelsea, and I finally obtained a very small amount. As this was my second similar experience in Chelsea (the first refusal being on account of "having none on hand"), I might state that the interests of Chelsea practitioners are well guarded against foreign invasion.

Yours truly,
R. Guralnick.

## USE OF BENZYL BENZOATE FOR AFTER PAINS.

Allston, Mass., February 1, 1921.

*Mr. Editor:*—

While I am not an enthusiast over new drugs and new treatment, I think I have found a new field for the much discussed benzyl benzoate. I hold no brief for the drug and never used it till its adoption to the N. N. R., nor do I consider its use in this one case of much import. However, since I have seen no previous report of its use in this connection and do feel that it was a help in this case, I am offering the JOURNAL, a brief report, simply in the spirit of wanting to pass along what, at present, seems like a good thing. Very respectfuly.

LAWRENCE C. CHISHOLM.

AFTER PAINS RELIEVED BY BENZYL BENZOATE. REPORT OF A SINGLE CASE. BY LAWRENCE C. CHISHOLM, B.S., M.D., ALLSTON, MASS.

Patient aged 24.

Three children dead, one miscarriage, one son, age three, living and well.

Sixth pregnancy normal throughout.

January 26, 1921. Normal delivery of twin girls, single placenta, two membranes. One membrane formed a caul about the first child and the other was delivered entire with the placenta. Time of deliveries: 9.50 and 10.10 P.M. The placenta was delivered a few seconds after the second child.

January 28, 12.15 P.M. Mother suffering with after pains of average severity. Given benzyl benzoate, five drops every four hours; 7 P.M., patient said she was much relieved by the medicine. Dose increased to seven drops.

January 27. Patient in good condition and still getting relief from the medicine for three hours after each dose. Dose not increased but interval changed to three hours.

## TRANSPORTATION OF HABIT-FORMING DRUGS.

New York, January 24, 1921.

*Mr. Editor:*—

I am sending you for publication a copy of a letter sent to Senator Jones expressing the opposition of the Public Health Committee of the New York Academy of Medicine to the proposed measure which prohibits the exportation from and transit through the country of habit-forming drugs and restricts importation to such amounts of crude opium and cocoa leaves as the United States Public Health Service may determine.

The Committee is opposed to the bill for the following considerations:

1. The government regulation would create a dearth of drugs and concomitant increase in price.

2. Smuggling will be encouraged, the drug addicts will continue to be supplied through illicit channels and legitimate medical requirements will suffer.

3. A monopoly of production of morphine, codeine, and cocaine will be created as importation will be limited to crude products only.

4. The desired protection of drug habitués in foreign countries could be obtained if the existing law be amended in conformity with the provision of the Hague Convention of 1912, limiting exportation to such persons in foreign countries as possess permits for the importation of the drugs.

Will you please give this letter publicity in your next issue.

Very truly yours,
E. H. LEWINSKI-CORWIN,
*Executive Secretary*

My dear Senator:—

The Public Health Committee of the New York Academy of Medicine has given a great deal of consideration to your bill, No. 4553, which prohibits the exportation from and transit through the country of habit-forming drugs and restricts imports to such amounts of crude opium and cocoa leaves as the United States Public Health Service may determine.

The Public Health Committee is in full sympathy with the motive of this bill but desires to point out certain difficulties which would arise if this bill were enacted into law.

1. To entrust to official discretion the determination of the amount of crude drugs to be imported into the United States for medicinal purposes is likely to result in there being no reserve for unforseen emergencies: first, because of the limitation of the supply; and secondly, because of the probable deflection of a certain amount into illicit channels, creating a dearth of the drugs for legitimate medical purposes and resulting in a great deal of suffering.

2. The limitation of imports, as proposed, will create a tendency to smuggling with which, in view of the difficulty of tracing small amounts which could be sent in letters and other ways, it would be exceedingly difficult for even a large force of custom house officials to cope. In other words, legitimate users would be handicapped while those whom we try to protect will not be benefited by the legislation.

3. If the present law should be amended to incorporate the provisions of article 13 of the Hague Convention of 1912, that is, to limit the exportation of drugs to such persons in foreign countries who have special authorization or permits from their respective governments for the importation of the drugs in question, sufficient control would have been provided for the protection of the drug habitués in foreign countries and, moreover, this would be more in accordance with the provisions of the aforesaid treaty than the complete prohibition of exports.

4. The limitation of imports to but crude opium and cocoa leaves would mean that no morphine, codeine, cocaine, and other preparations could be obtained in this country except of local manufacture which would be a trade protective measure of an extreme character and it will inevitably tend to increase the price of these products for legitimate purposes.

These are the principal reasons why the Committee is opposed to the bill as proposed by you. In the opinion of the Committee, such a law will only be unduly restrictive on those who will legitimately have to use the drugs and it will not in any way change conditions it is intended to ameliorate.

We sincerely hope that you will give thoughtful consideration to the objections raised by the committee.

## RECENT DEATHS.

DR. CHESTER CHARLES BECKLEY, a Fellow of the Massachusetts Medical Society, a practitioner of Lancaster, Mass., died at the Clinton Hospital on February 4, 1921, aged 45 years. He was graduated from the University of Vermont College of Medicine in 1898 and settled in Lancaster the following year. He was in the Medical Corps during the late war, holding the rank of major while overseas.

The Boston Medical and Surgical Journal

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# Original Articles.

## SEMINAL VESICULITIS: ITS LOCAL AND GENERAL MANIFESTATIONS.*

BY JOHN H. CUNNINGHAM, M.D., BOSTON.

IT is my belief that the medical profession, in general, knows perhaps as little about the seminal vesicles as any other organs in the body. Moreover, it has only been in recent years that the leaders in the field of genito-urinary surgery have given the diseases of these organs the attention which they deserve. Most of us have had an indefinite idea of their anatomical location and structure, that they have something to do with propagation, and some may recollect that Dr. Eugene Fuller has written much about gonorrheal focal infection in these organs, producing so-called gonorrheal rheumatism and that by removing these foci the rheumatic manifestations can be cured. Perhaps some remember that Dr. William Belfield of Chicago has likened gonorrheal infection in the seminal vesicles to gonorrheal infection in the Fallopian tubes and has called the seminal vesicle so infected the pus tube of the male, and has devised an operation to attempt to cure such seminal vesicle infection by irrigations through the vas deferens. But in general, a comprehensive understanding of the diseased seminal vesicle, the local and general manifestations dependent upon it are lacking, even among most who profess to be especially interested in the subject of genito-urinary surgery.

Naturally it is impossible to cover the whole subject of the anatomy, physiology, pathology, and the diagnosis and treatment of all diseases of the seminal vesicles at this time, and attention, therefore, will be directed only to infections, non-tubercular, chiefly gonorrheal in origin, the symptoms they produce, and the treatment which such conditions should receive.

In regard to the *clinical pathology*, an anterior urethritis, usually, but not always of gonorrheal origin, extending to the posterior urethra may infect the glandular structure of the prostate, extend up the ejaculatory ducts to the seminal vesicles and down the vas deferens to the epididymis so that through the continuity of the different organs in the genital system we may have an extension of an anterior urethritis through the whole genital tract and when an epididymitis is observed in connection with anterior urethritis it is certain that the infection has involved to some degree all the structures in its course to the epididymis.

The prostate and vesicles having once become infected, remain so over long periods of time, because the natural avenues of escape for the products of inflammation are very small and not sufficient in size to drain the infected areas. In fact, it is questionable if the prostate or seminal vesicles once infected ever become absolutely healthy organs. Certain it is that remissions of urethral discharge and recurrent epididymitis, also certain systemic infections find their explanation in this fact. It is, therefore, the retention of infection and the products of inflammation in the prostate and seminal vesicles that result in the clinical disturbances both local and general.

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*The local disturbances* are a urethral discharge, often with remissions, but sometimes persistent over long periods of time, often many years, which discharge, if not recognized as originating from the infected prostate and seminal vesicles, is generally treated as an anterior infection by internal medication and anterior injection without beneficial results. This is the common observation of the genito-urinary specialist, who so often gets the patient after both the patient and the uninformed doctor have been discouraged by the lack of progress.

Investigation of the prostate and seminal vesicles by rectal examination and by a microscopical examination of the fluid expressed from these organs locates the lesions in these structures if they are present, and in the absence of lesions in the anterior urethra, which fact is established by the microscopical examination of any urethral secretions; by calibration and endoscopy, the treatment of the prostate and seminal vesicle lesions is begun by prostatic and vesicle massage, installations or irrigations, which treatment will have to be pursued for months in most instances, and even then a cure may not be attained.

There is a group of patients from whom infectious material cannot be removed from the seminal vesicles no matter how long appropriate palliative treatment is carried out, for the reason that certain infected areas cannot be kept sufficiently open to drain through the natural channels, an explanation of which will be found by studying the anatomy of the seminal vesicles which shows their structure to be one of multiple branches and numerous diverticulae. This group of patients to be made free from a urethral discharge and infection must have the seminal vesicles removed or completely drained to affect a cure. In other words, it should be thoroughly appreciated, especially in view of the present campaign against venereal diseases by the Public Health Service, that there is a group of male individuals with infected seminal vesicles and prostate whose only symptom is a persistent or intermittent urethral discharge. I think it is fair to say that no attempt is made by most doctors who are willing to treat such patients to locate these lesions by making an examination of the anterior urethra by a microscopical examination of the urethral discharge; calibration of the anterior urethra for stricture, or to prove or disprove their presence by endoscopy, and moreover, the knowledge of the condition of the prostate and seminal vesicles which may be gained by massage of these organs through the rectum, collecting the material so expressed and the microscopic examination of the collected material, is too seldom done. Unless one appreciates the methods of locating the lesions as just mentioned, the individual with a urethral discharge is usually treated by internal medication and anterior injections without benefit. To carry the matter of treatment a step further, those who have much to do with venereal diseases recognize and employ the methods of diagnosis just referred to and treat the patient with seminal vesicle and prostatic infection by massage of these organs, thereby emptying them of the products of inflammation, following the massage by irrigations or installations, giving careful directions regarding a non-irritating diet and the necessity for large ingestions of water. They realize further that progress is slow, and months of time are necessary to affect a cure under the most appropriate treatment. They recognize also that recurrences of discharge are prone to occur even after all symptoms have been absent for months or even years. They also appreciate the fact that there is a small group of patients with infection of the prostate and seminal vesicles, who, no matter how long or intelligently treated, cannot be freed from the discharge of pus from the lesions located in the prostate and seminal vesicles. It was for this group of patients that Dr. Belfield devised and practised the procedure of irrigating the diseased seminal vesicle by opening the vas deferens through a scrotal incision and injecting an antiseptic solution up the vas deferens and through the diseased seminal vesicles with the idea of cleansing and killing the infection within it This procedure, based upon a thoroughly sound conception has not proved to be all that may be desired because it is seldom that a single injection produces a cure and repeated injections are not always possible because of the difficulty of keeping the incision in the vas deferens open, and because, furthermore, the solution injected may not enter all the infected areas. That there are some patients cured by this method of treatment is unquestionable; but on the whole the results are not satisfactory. With these patients where failure results from this procedure nothing short of thorough surgical drainage or the extirpation of the diseased organs will result in a cure.

I have found it necessary to perform such an operation on forty patients who had received local treatment over periods of months or years; the areas of infection being persistently active, or quiescent at times, to be followed by acute exacerbations without known cause in many, or after the lowering of the general resistance by overwork or some acute illness such as influenza.

The operation should be undertaken only after many months of conscientious local treatment and it is evident that a cure of the lesions cannot be attained by any treatment other than the removal of the lesions surgically. If the operation is undertaken, under the circumstances indicating it, as just mentioned, the prostate should be drained also, for it has been definitely proved that an infection may be expected to co-exist within it, to some degree at least, when the seminal vesicles are infected.

As a result of the operation the majority of patients are free from any urethral discharge before the operative wound is healed and those who require any further treatment have been those patients with associated urethral mucous membrane changes, which changes, whether dependent or independent of the prostate and seminal vesicle infection, cannot be cured when constantly bathed in the products of inflammation from persisting lesions in these organs.

I wish to briefly touch upon another local manifestation dependent upon infection in the seminal vesicles and prostate, namely perineal and genital pain, which pain is sometimes referred to the rectum and accentuated by defecation. This pain, as far as I can judge, is indefinite in character, sometimes severe and usually observed in neurasthenic individuals; and associated with sexual disturbances, painful erections, frequent nocturnal emissions and sometimes the semen ejaculated or collected by massage is mixed with blood. These patients often without any urethral discharge usually give a history of previous urethritis, but in some instances, such an infection has been denied. When the examination of such patients shows the absence of rectal and bladder disease and the presence of palpable changes in the prostate and vesicles associated with abnormal elements in the fluid expressed from these organs, the pain may be ascribed to disease in these structures. Dr. Eugene Fuller, the father of seminal vesicle drainage, insists that such lesions in the seminal vesicles may account for these indefinite pains and produces the condition commonly called sexual neurasthenia.

There are so many factors entering into the complex picture of sexual neurasthenia that I personally cannot accept his dictum without reserve, and believe that changes in the verumontanum, the so-called sexual heart, if present, should at least receive treatment, and local treatment of the seminal vesicles tried before subjecting such patients to seminal vesiculectomy as advocated by Dr. Fuller. In support of his contention, however, it should be stated that those patients upon whom I have operated for other indications, but with the type of pain referred to, have usually been improved in this respect also, and those with what might be called neurasthenia have improved as a rule. I have been inclined, however, to ascribe such mental improvement not entirely to the removal of the disease in the seminal vesicles but rather to the mental relief incident to worry because of the persistent urethral discharge, the necessity for constant medical care and the multiplicity of social factors which influence the mental attitude of one with a secret disease.

In regard to the *general manifestations* dependent upon infection in the seminal vesicles and prostate, aside from those just referred to as neurasthenia, and which may or may not be so considered, I wish to refer to the metastatic disturbances particularly the arthritic manifestations.

It has become a well-established fact that foci of infection may, through some peculiar selective action, involve other structures, particularly the synovial membranes and bones, so that today the profession in general, look for some focus of infection to explain so-called rheumatic manifestations. The teeth and tonsils have attracted the most attention as the sites of such foci; in fact, the profession, in general, think too seldom of any other possible nidus of infection; and often with only questionable lesions in these structures, teeth or tonsils or both are being sacrificed without a thorough differential diagnosis; often with the good fortune of a brilliant cure of the metastatic arthritis when the interpretation is correct; but sometimes without this good fortune because the foci are located elsewhere. Not infrequently such foci are in the deep genital structures and occasionally in the digestive or urinary tract, all of which systems must be considered in the differential diagnosis in any instance where there is not an obvious focus of infection in the teeth, tonsils or head sinuses to explain the arthritis.

It is of interest in this connection to note the fact that the first conception of curing arthritis by the surgical removal of foci of infection was brought forward by Dr. Eugene Fuller of New York in a publication in the *Annals of Surgery*, June, 1905, entitled "The Relation of Gonorrheal Rheumatism to Seminal Vesiculitis and Its Cure by Seminal Vesiculotomy. What Dr. Fuller pointed out at that time and in his later publications, also the publications of others in this connection have not been generally appreciated; and today, when the principle of focal infection as an explanation of infectious arthritis has been generally accepted, foci of infection to explain metastatic arthritis are commonly thought of; the teeth and tonsils alone, being considered by most, and the possibility of foci in the prostate and seminal vesicles as the possible cause of the arthritis is usually the least thought of in this connection. It is my desire to emphasize the importance of including such possible sites of infection in the differential diagnosis of infectious arthritis for I have seen too many patients who have had their teeth and tonsils removed without benefit to their arthritis because the foci of infection were in the prostate and seminal vesicles.

I do not wish to convey the impression that the removal of foci of infection in teeth and tonsils are not followed by brilliant results, or that gonorrheal arthritis is usually an obscure disease and not generally recognized; but I do wish to convey the idea that gonorrheal arthritis may be dependent upon a gonorrheal infection of so long standing, and the urethral discharge so slight or even absent, that unless the fact of a previous urethral infection is elicited in the history and a special examination made to determine the condition of the prostate and seminal vesicles, that foci of infection in these organs as the cause of an obscure arthritis may be overlooked.

The common course of events is that a gonorrheal arthritis will develop while the patient still has a more or less active urethral discharge from lesions in the prostate and seminal vesicles, yet I have observed patients in whom chronic prostatitis and seminal vesiculitis, of gonorrheal origin, has persisted with or without remissions of urethral discharge over long periods of time, and the onset of the arthritic manifestations had no other possible explanation except from the foci of infection in these deep genital structures. I have also observed patients with a chronic prostatis and vesiculitis and associated arthritis who denied any urethral infection and who have no urethral discharge; but the material expressed from the prostate and seminal vesicles has shown evidence of existing infection in these organs. I am convinced that all infections in the prostate and seminal vesicles are not gonorrheal in origin. It it interesting to note that Billings has pointed out the relationship of chronic staphylococcus infection of the seminal vesicles to arthritis deformans and that infection in these organs, other than by the gonococcus, may produce systemic disease.

Other metastatic manifestations that should be mentioned in connection with foci of infection in the deep genital organs are gonorrheal iritis and synovitis, particularly of the tendo Achilles, which complication, like metastatic gonorrheal arthritis, require that the foci of infection be cured to relieve these complications.

The method of establishing the presence of foci of infection in the prostate and seminal vesicles, as already alluded to, is that the history should, as a rule, disclose an existing or previously existing urethral discharge and the material expressed from the prostate and seminal vesicles by rectal massage, and collected in a clean dish must show, by microscopical examination, clumped pus and desquamated cells from the prostate and vesicles, or both. The absence of the gonococcus is not important, in fact other organisms are more frequently found. If the gonococcus is present it is not usually found within pus cells unless the infection is recent or particularly active.

The pathological changes noted by rectal palpation are in the form of a boggy enlargement of the prostate with or without nodules, and enlargement of the seminal vesicles with thickening of their walls, or the vesicles may not be detected because of the plastic exudate of a perivesiculitis. It is, however, the microscopical examination of the secretions expressed from these organs that gives the true evidence; just as the examination of the urine does with a palpable kidney.

The *diagnosis* therefore depends upon the history of urethral infection, the demonstration of pathological changes in the prostate and seminal vesicles by rectal palpation and above all, the presence of clumped pus in the microscopical examination of the secretions expressed from these organs. The complement fixation test for gonorrhea is of value and should always be employed in determining whether or not an arthritis condition is gonorrheal in origin. It is the contention of some authorities that the administration of gonorrheal vaccine may render an otherwise positive reaction negative; which fact must be borne in mind.

The *treatment* of foci infection in the prostate and seminal vesicles associated with metastatic manifestations does not differ from that of such infections without the metastatic disturbances, except for the employment of gonorrheal vaccines, and certain orthopedic features when indicated to relieve local suffering. The cure, of course, depends upon the destruction of the focal infection in the deep genital organs. This may be accomplished by nonoperative treatment, as already mentioned, in the form of prostatic and vesicle massage, irrigations and installations, vaccines and general treatment Such palliative treatment is effective in about 10 per cent. of patients with real gonorrheal arthritis. In the mild cases non-operative treatment suffices to relieve all of the most acute symptoms, improvement is slow, recurrences are prone to occur and the individual must be considered to be infectious until proven otherwise.

If palliative treatment does not show satisfactory progress after a trial of weeks or months, or if the disturbances progress, the process may be arrested by the surgical removal of the foci of infection.

There is no operation for a chronic condition with which I am familiar, which gives more brilliant results. With the removal of the foci of infection, the pain has disappeared from the affected joints, often at the time of the ether recovery; and large, swollen joints have become normal in appearance, or nearly so, and painless, voluntary motion is often possible within twenty-four to forty-eight hours after operation. The periarticular swellings disappear much more rapidly than those which are intra-articular, and when destruction in cartilage and changes in bone have taken place, as may be expected if the articular lesions are of long standing, a considerable period of time and appropriate accessory treatment are necessary to repair such defects. Nevertheless the activity of the process is arrested with the removal of the foci of infection and the repair process may begin.

The indication for operative treatment is a failure to produce a cure by palliative measures.

I wish to refer to certain features connected with the operative results about which I have often been asked. Those who have observed the course of these patients admit the brilliancy of the results, but naturally wonder what influence the operation has upon the sexual life.

I have performed the operation of seminal vesiculectomy or vesiculotomy with prostatotomy on about two hundred patients and have yet to learn of a patient who has become impotent. That they are sterile, I believe, although I have had a few patients who insisted to the contrary. In connection with the matter of sterility, it is probable that a large percentage of patients with advanced seminal vesiculitis and prostatitis are sterile because of the lesions and the operation cannot add to the damage already done. Whatever the known truth of this feature may be, it is certain that most patients with seminal vesiculitis and prostatitis must be considered infectious to others; and moreover those patients with real gonorrheal arthritis, that is so severe as to require operation, think little of sexual life and, being infectious, should not be permitted to if they did. Most are chronic invalids and when given the choice of being made useful individuals at the expense of reproduction (which they have probably lost anyway from the lesions), there has never been any hesitation in accepting the chances of cure by operation.

Another point which has been raised is the question of relapses. I have seen but two patients with returning symptoms and both of these patients had their symptoms return only after acquiring a new gonorrhea. One of these patients had played professional baseball for six years following his operation, having been out of the game two years previously on account of his gonorrheal arthritis. His recurrences were relatively slight and subsided with the disappearance of the new gonorrhea which was an anterior and posterior infection.

The other patient was a chauffeur who had periosteal spurs removed from both os calces at the time his vesicles and prostate were attacked. This patient was known to have flat foot at the time of operation. Three years after the operation he acquired a new gonorrhea involving the anterior and posterior urethra. He had a tenio synovitis of both tendo Achilles which disappeared with the activity of the new infection.

In considering the operative results it must be borne in mind that those patients who have changes in intra-articular cartilage such as destruction or ulceration and bone changes, atrophy or periosteal hyperplasia, must have appropriate accessory treatment to repair such defects. What the operation does in this group of patients is to remove the foci of infection which causes these changes that repair may be accomplished. The results in those patients who have the foci of infection removed before destructive metastatic lesions develop, are of course, the most brilliant.

In performing the operation both the seminal vesicles and the prostate should be attacked, for there is abundant clinical and pathological evidence to show that infection may be expected to exist in both, and clinically I have observed patients improved only but not cured by the mistake of the operator to destroy only the lesions in the seminal vesicles. A second operation, draining the prostate, has resulted in a cure. Likewise it is necessary in attacking the seminal vesicles that every focus of infection be destroyed. For that reason multiple punctures sometimes fail in their purpose. When possible it is probably safer to extirpate the vesicles, or if not to remove the entire posterior surface and sterilize every portion with carbolic acid and alcohol. I have done a secondary operation upon a patient who had the seminal vesicles drained by puncture and a prostatotomy performed with only partial relief, and a subsequent removal of the vesicles resulted in a cure.

I am convinced that nothing short of a complete removal of all foci of infection will give the desired result; and while to accomplish this it may be necessary to thoroughly destroy the vesicles, the prostate needs only free drainage by multiple incisions. Patients who have been operated upon without benefit are those in whom the operation is incomplete.

*In Conclusion.*

1. I wish to suggest that patients with a persistent urethral discharge be examined to determine the condition of the prostate and seminal vesicles as well as the condition of the anterior urethra.
2. That there is a group of patients with infection in the seminal vesicles and prostate which cannot be cured of a urethral discharge except by destroying such lesions by surgical measures.
3. That the possibility of foci of infection in the seminal vesicles and prostate be included in the differential diagnosis of infectious arthritis.
4. That patients with such foci of infection and metastatic disturbances be subjected to surgical drainage of such foci of infection if improvement is not satisfactory by non-operative treatment.

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# PRIMARY DISEASE OF THE PELVIC LYMPHATIC GLANDS. AN UNRECOGNIZED GYNECOLOGICAL CONDITION

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Although no little study has been given to the lymphatic glands of the pelvis from both the anatomical and clinical standpoints, such investigations have been practically limited to the consideration of these glands in malignant disease of the uterus or other pelvic organs. The possibility of non-malignant disease of these glands, as well as that of primary malignant, lymphatic disease seems to have been overlooked. The occurrence of three cases of enlargement of the pelvic glands giving rise to striking clinical manifestations during a two months' service in the gynecological ward at the Boston City Hospital has led the writer to believe that pelvic masses consisting of such glandular enlargement must be of not infrequent occurrence although but seldom recognized. The term primary disease of the pelvic lymphatic glands is, perhaps, somewhat inaccurate inasmuch as with the sole exception of lymphosarcoma or Hodgkin's disease, involvement of any part of the lymphatic tract must be secondary to a process in some other organ or tissue. I have selected the title, however, to differentiate those cases in which the enlargement of the glands in itself gives rise to important clinical manifestations, from those in which the enlargement of the glands is solely a measure of the extent of a malignant process in another organ.

## ANATOMICAL.

The lymphatic vessels and nodes of the pelvis have been carefully studied by numerous anatomists. Their arrangement is quite simple. The lymphatic vessels follow in general the distribution of the various branches of the external and internal iliac arteries.

The glands are arranged in five groups. These are the lumbar, the external iliac, the internal iliac, the sacral, and the inguinal glands. The lumbar glands lie on either side of the aorta and receive all the lymphatics from the pelvis and lower extremities The external and internal iliac glands lie in chains along the respective arteries of the same name. The sacral glands lie in front of the sacrum just below the bifurcation of the aorta, and the inguinal glands lie in front of the superficial fascia over Poupart's ligament and in Scarpa's triangle.

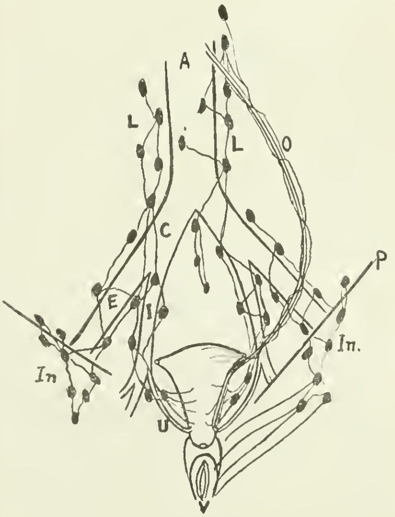
The inguinal glands receive the lymphatics from the vulva and the superficial tissues of the thigh and groin. They are drained in turn by efferent vessels which pass beneath Poupart's ligament to the external iliac glands. The external iliac glands in their turn drain into the lumbar glands.

The internal iliac glands receive the lymphatics from the cervix and the lower part of the body of the uterus. They, too, drain into the lumbar glands. The lymphatics from the fundus uteri, the Fallopian tubes, the ovaries and the upper part of the broad ligaments follow the course of the ovarian artery upward to either side of the aorta where they empty into the lumbar glands.

The lumbar glands, after receiving the lymphatics from the external and internal iliac glands, the sacral glands, and the lymphatics accompanying the ovarian artery, thus draining the pelvis and entire lower extremities, empty into a few large trunks which unite with the lacteals to form the thoracic duct.

Two more anatomical relationships of these glands are important because of the clinical manifestations resulting from their disease or enlargement. The first of these is their relationship to the psoas muscle. Both the external and internal iliac glands and the lumbar glands are in close relationship to this muscle. This is important clinically because in two of the cases to be reported psoas spasm was a prominent symptom.

The other important structure in relation with these glands is the ureter. The ureter crosses over the external iliac artery just below the bifurcation of the common iliac and passes downward and forward about midway between the external and internal iliac arteries, following somewhat the course of the uterine artery which later crosses over it just before the ureter enters the bladder. Both the external and internal iliac glands, but more especially the latter, are therefore in close relationship to the



Lymphatics of the Pelvis (Diagrammatic)

*A*, aorta; *C*, common iliac artery; *E*, ext. iliac artery and glands; *I*, int. iliac artery and glands; *L*, lumbar glands; *O*, ovarian artery and lymphatics; *In*, inguinal glands; *P*, Poupart's ligament; *U*, uterine artery; *V*, vulva.

ureter, and marked enlargement of these glands may compress the ureter and cause obstruction, as occurred in the first of the cases to be reported.

### CLINICAL.

*Case Reports.*

Case 1. Boston City Hospital No. 404528. Age, 34. Married. Four normal labors, two miscarriages. Came to Out-Patient Department on June 20, 1920, complaining of pain in the left abdomen of a few days' duration. Examination showed marked tenderness over left kidney and along course of left ureter. The urine was negative, both chemically and microscopically. By vaginal examination a mass on the left side, well out toward the pelvic brim and not connected with the uterus was found. The uterus was in normal position. The right side of the pelvis was normal. The temperature and pulse were normal. General physical examination was negative except for a slightly cachetic appearance.

The patient was referred into the hospital for observation and the following day a cystoscopy was done. The bladder mucosa was normal and both ureteric orifices were normal, but on catheterization of the left ureter, obstruction was met with, about three-fourth to an inch from the bladder. This was confirmed by the use of several catheters of different sizes. On the right side the catheter was easily passed to the kidney pelvis. Diagnosis of a pelvic mass of unknown character not arising from the uterus or uterine appendages and causing obstruction of the ureter was made.

Operation June 25, 1920. Median incision below umbilicus. Uterus and appendages found normal. Over left pelvic brim beneath peritoneum, an irregular nodular mass was found. The peritoneum was incised and the mass which was dissected out with much difficulty was found to consist of greatly enlarged external and internal iliac lymph glands. The mass had compressed the external iliac artery to about one-half its usual size. The glands were closely adherent to the ureter, from which they were separated with care and the ureter freed from compression. The patient made an uninterrupted recovery, the abdominal pain cleared up at once, and she was discharged from the hospital in two and one-half weeks.

Pathological examination of the glandular mass by Dr. Frank B. Mallory showed changes identical with those of Hodgkin's disease. Following the receipt of the pathological report, a second physical examination was done and a careful search made for enlarged lymph nodes in other parts of the body which, it was thought might have been overlooked in the first examination, but absolutely none were found. A blood examination was done by Dr. Ralph C. Larrabee with the following result: haemaglobin, 72.8%; red corpuscles, 3,710,000; white corpuscles, 11,600; color index, .98. Differential count: polymorphonuclears, 78½%; eosinophiles, 0; mast cells, 0; large lymphocytes, 15½%; small lymphocytes, 2½%; large mononuclears, 0; transitional, 3½%. No achromia. Moderate variation in size, prevailing size probably normal. No large oval cells. No fragmented cells. Shape of red cells normal. Platelets somewhat diminished.

Case 2. B. C. H. No. 404999. Age, 28. Single. Entered hospital June 30, 1920. For one week intense pain in the left groin, and lameness. Examination showed marked tenderness over the left iliac fossa without rigidity. There was a psoas spasm causing about 15 degrees flexion of the thigh. Complete extension was impossible. A few slightly enlarged and very tender inguinal glands were palpable on the left, which were apparently secondary to a small area of pustular eczema on the left labium majus. Vaginal examination showed nothing abnormal except marked tenderness over the left pelvic region. Temperature, 102.8; pulse, 100; white count, 9,000; haemaglobin, 85%. X-ray examination of the pelvis negative. The patient was put to bed, ice applied to the left iliac regions and measures of cleanliness instituted to the eczematous region. The temperature gradually fell to normal, and the iliac tenderness and psoas spasm disappeared. July 26 vaginal examination disclosed a mass along the pelvic brim very similar to the mass described in the previous case, obviously not connected with the uterus or appendages. All symptoms had now disappeared so the patient was discharged without further treatment. There can be no doubt, however, that in this case infection was carried from the eczematous area on the vulval to the inguinal glands and from these to the iliac glands, the inflammation of which latter resulted in the iliac tenderness and psoas spasm which were the most striking symptoms the patient presented.

Case 3. B. C. H. No. 403,383. Colored. Age, 38. Married. One child five years old. On April 8, 1919, uterus and both tubes and ovaries had been removed for myoma by supravaginal hysterectomy. She was well after this operation until December, 1919, when, following a supposed attack of influenza, she developed pain in the right lower quadrant of the abdomen and lameness of the right leg. Entered hospital May 11, 1920. Right thigh in 15 degrees flexion. Complete extension impossible. Temperature normal. Pulse normal. White count, 11,200. Haemaglobin 75%. X-ray of pelvis negative. Vaginal examination showed a mass closely connected with the pelvic wall on the right rising somewhat above Poupart's ligament and not connected with the cervical stump, which was still present. The diagnosis was made of psoas abscess of unknown cause.

Operation June 2, 1920. Incision one inch above and parallel to right Poupart's ligament, carried down to subperitoneal layer. The peritoneum was then carefully dissected backward and an abscess containing several ounces of odorless pus, occupying the general region of the iliac vessels and anterior to the psoas muscle, was drained extraperitoneally. No direct communication with the cervical stump was made out.

Following operation the psoas spasm disappeared almost immediately, the sinus healed rapidly and the patient was discharged well June 22, 1920. There may be in this case, some doubt as to this abscess having its origin in the pelvic lymphatic glands. After careful reflection, however, I am convinced that this is a companion case to the first two for the following reasons: first, the location of the mass was similar to that in the other two cases; second, because the symptoms of iliac pain and psoas spasm closely resembled those in Case 2; third, the uterus and appendages having been removed, the pelvic lymph glands would be practically the only remaining organs or tissues which could be the seat of suppuration. The portal of entry may have been the cervical canal, the infection having travelled by the cervical lymphatics to the iliac glands; or the infection may have been blood borne. Many queer local suppurations have been observed in remote parts of the body following influenza and this abscess may have been one of them, if we admit the accuracy of the diagnosis of influenza in this patient.

### DEDUCTIONS.

While these cases are too few in number from which to draw final conclusions, they present certain very suggestive points. It is definitely proven by the existence of two undoubted cases and one probable case that such a thing as primary disease of the pelvic lymphatic glands producing striking, if not characteristic symptoms, does exist. A search of a dozen or fifteen recent textbooks of gynecology fails to reveal any mention of such a possibility. Therefore it seems worth while to analyze these cases from the standpoint of a study of the symptom-complex to be expected from this condition.

*Tumor.* A mass in the pelvis close to the pelvic brim and definitely not connected with the uterus or its appendages was present in all three cases.

*Pain.* Pain was present in all three cases. In two it was localized in the right iliac fossa. In Case 1 it was localized along the course of the ureter and in the kidney region and was due to occlusion of the ureter by pressure of the glandular mass from without.

*Psoas Spasm.* Psoas spasm was present in two of the three cases and must be regarded as quite an important symptom. Of course an x-ray of the spine is necessary to rule out the mass and contracture due to psoas abscess from spinal caries.

*White Count.* The white count in all these cases, even the one with abscess, ranged between 9,000 and 11,600. Further observations may or may not reveal higher white counts in more virulent infections. The white count, obviously, must be influenced in great part by the particular organism concerned as well as the resistance of the patient.

In reference to the case of Hodgkin's disease primary in the pelvis glands, this cause of enlargement as well as the ureteral compression resulting must be looked upon as a rare and unusual occurrence to be seldom met with but to be borne in mind as a possibility. The writer believes that further investigation will show that many of the pus masses not uncommonly met with in puerperal sepsis extending upward along the psoas muscle and pointing above Poupart's ligament consist of suppurating iliac glands, as the lymphatics from the body of the uterus drain directly into these glands and form the most probable path for infection to travel.

### TREATMENT.

The treatment of disease of the pelvic lymph glands is the same as that of enlarged or diseased glands elsewhere in the body. A mass definitely containing pus should be opened. Where the glands are acutely inflamed but suppuration has not taken place, treatment should be restricted to rest and cold applications. Where enlargement of the glands is sufficient to cause pressure on important organs as in Case 1, and does not rapidly subside under palliative treatment, excision will be indicated.

### CONCLUSIONS.

Primary enlargement of the pelvic lymph glands is a distinct clinical entity not generally recognized in gynecology.

The diagnosis is to be based upon a pelvic mass definitely not connected with the uterus or its appendages, giving rise to the following symptoms: pain and tenderness referred to the iliac fossa of the affected side, with or without elevation of temperature, and with or without psoas spasm on the affected side. The white count in the few cases so far observed has been only slightly elevated.

# FASCIA USED TO MOBILIZE A STIFF KNEE RESULTING FROM GUN SHOT WOUND.

By Louis A. O. Goddu, M.D., Boston,

*Orthopedic Surgeon to Out Patient Department of Massachusetts General Hospital; Chief Orthopedic Surgeon to Woonsocket Hospital.*

## *History.*

Patient, a boy 18 years of age. On October 12, 1915, the patient had planned to go hunting pheasants with his chum. In an accidental way his chum's shot gun was discharged and (in the patient's own words) "blew off one-half of my knee-cap and the charge entered the center of the knee, eating off the large tendon in front. It took off the outside, just leaving the hamstrings. While my chum was taking me back to the farm house where we spent the night before, I learned a little more about knee-joints. I noticed a lot of little fine threads that seemed to be a little mixed up. I was also surprised to see how the bullets went through the bone, having cut off one-third of the knee-cap and shattered the side of the joint. We arrived at the farm house and called the local doctor and at 10 o'clock I was at the Waltham Hospital."

At the Waltham Hospital the patient was etherized and operated upon by Dr. Stiles of Waltham. Dr. Stiles states the patient was very exsanguinated and weak. Ether was given and he made a repair of the patellar tendon as well as possible and at that time, Dr. Stiles states, a good deal of tissue was lost. As good a repair was done as possible and wicks placed in the knee. The patient again describes his condition: "Until five days later they had little hope of saving the leg as the knee was, of course, blood poisoned. Then they stated that they could save the leg but that it would be of little value. Amputation was suggested, but refused."

About two weeks later the writer was called at the Waltham Hospital in consultation with Dr. Stiles. The knee presented a large, swollen, red appearance, a wick coming out just below at the outer and lower border of the patella, the patient still having typical, fluctuating septic temperature. The patient himself presented a very much depressed, anemic and thin appearance. The wound was discharging pus, but temperature not very high.

The writer advised conservative treatment on general surgical principles, also an injection of anti-tetanus vaccine. The patient remained at the hospital six weeks, was released with a discharging sinus in the knee which at the expiration of four months healed up. Through this period the patient had baking and massage by his own local physician. The writer saw the patient a second time on April 15, 1916, or about six months after the injury. At that time the physical examination showed the young man had improved a little in his physical appearance, but not a great deal: still thin, anemic and careworn in appearance.

The mother states that during the past month he had been becoming depressed and, as she describes it, going down hill. Examination of the knee showed a large scar at the outer aspect of the joint. The whole outer portion of the knee-joint, for an area as big as the palm of the hand, seemed adherent. The patient's story at this time was that the knee was constantly paining him and that he was afraid to walk because any little thing that he hit, such as a pebble, or if he stubbed his toe, made him have pain enough to almost faint. The writer's examination showed less than five degrees motion, very painful, rather firm resistance, more than could be accounted for by active resistance. X-ray was asked for.

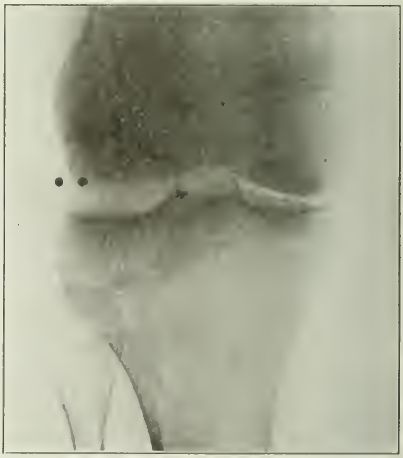


Fig. 1.

X-ray, as can be seen, shows knee-joint with thirteen bullets in it, a portion of the lower end of the patella gone and distinct irregularity in the articulating portion of the external condyle of the femur. The patient returned in one week. In view of the fact of the large portion of tissue lost and the great amount of pain, the writer advised permission for excision, providing an arthroplasty would not seem advisable. Patient stated he would rather have a stiff knee he could use rather than the one he had.

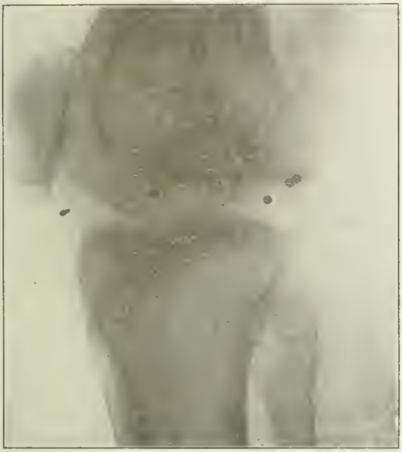


Fig. 2.

April 24 the patient was given complete anesthesia, operated upon, and lineal incision was made on the external portion of the knee carried straight down. The entire skin fascia and capsule were adherent, as well as patella. All adherent tissue was lifted up from the bone and the joint exposed. A portion of the articulating surface of the femur that was destroyed could plainly be seen. The problem was what to do towards replacing the destroyed portion of the capsule. The writer felt that with such good joint surfaces and in view of the fact that an excision of the knee could be done any time later, if necessary, an arthroplasty should be tried. The right thigh, which had previously been prepared for such an exigency, was exposed and incision made about eight inches long and a piece of fascialata about five inches long removed. This was placed in salt solution; and all the adherent portion of the capsule and the tibia and femur, together with patella, being freed also, this fascia was placed with the smooth surface in contact with the bone, done as posteriorly as could be done and sutured; also the upper portion sutured to the edge of the patella and the wound closed. Motion was started on the fourth day by placing the limb on an adjustable knee splint which the writer used and described in the *American Journal of Orthopedic Surgery.*

The old scar gave a little trouble breaking down but in spite of that the writer gave the leg a small amount of motion each day. At the end of six weeks the writer gave the patient a little ether as it seemed that there was a certain amount of contraction of the quadriceps tendon; which under an anesthetic revealed itself plainly.

The stretching of this tendon done, the patient stayed in the hospital one week again and forcible passive motion was given with active motion and, in the words of the patient, received in a letter December 9, 1916: "In just 10 weeks after the operation I went back to work in the machine shop with about 75° motion. I have not lost a day's work since, with over 90° motion which I now have, with no pain. I am sure I have something to be thankful for."

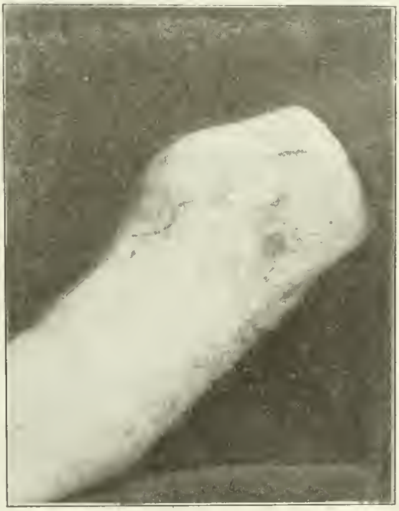


Fig. 3.

A Whitman plate was placed on the left foot because the foot was markedly pronated, and the patient had some pain in the inner aspect of the joint; also a split knee-cap reënforced with leather. The patient now runs, walks up stairs, and in fact has practically no disability except a small amount of crepitation in the knee-joint on flexion. The picture shows the incision which on account of the contracture seems irregular. The light scar tissue can be seen, also the two spots below are more reddened.

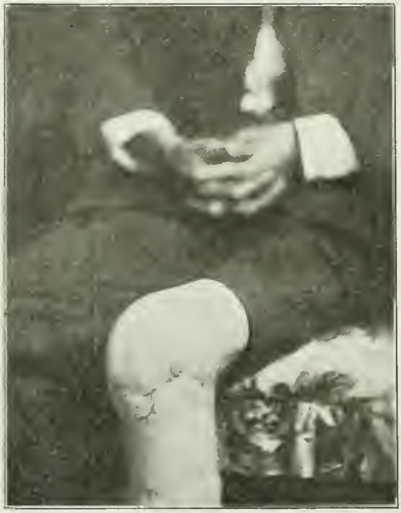


Fig. 4.

The second picture shows the knee in flexion, that is, active flexion. It might be stated that it was the earnest request of the mother that one bullet should be removed because there were thirteen. The writer made no great attempt toward prolonging the operation for such bullet, on account of the patient's poor condition, but, fortunately, one presented itself near the surface and was plucked out.

This paper was read and the case shown at the Boston Orthopedic Club in December, 1916, at which time he demonstrated his ability in walking and his strength in extension from the flexed position, and again, before the same club, in December, 1919, four years after the injury, at which time, for all intents and purposes, the knee was as useful as the other one. It was practically normal in flexion and had much power in extension—on the whole, a very useful joint.

This paper is presented for the purpose of demonstrating the advisability, sometimes, of using a conservative operation before resorting to a radical procedure, as in this case, a patching up, rather than an excision of the knee.

* * *

# DEFECTIVE DELINQUENTS IN THE ARMY OF OCCUPATION OF THE AMERICAN FORCES IN GERMANY. HOW THEY ARE TREATED IN THE DISCIPLINARY SCHOOL.

By Lt.-Col. L. Vernon Briggs, M.R.C., U. S. Army.
*(Late Division Psychiatrist, Headquarters Second Division, Germany.)*

During the war with Germany, there were in the American Forces many defective delinquents, who were not of low enough mentality to be rejected but who proved to be incorrigible, and who were a source of a great deal of trouble to their commanding officers. Many of them were repeatedly tried for petty offences, the most common of which was absence without leave, although charges of petty thieving and assault were not infrequent.

When this type of delinquent was absent without leave he got into all sorts of trouble; their absence was usually outside of the area, and they maintained themselves by begging, borrowing and living with dissolute women; or some times French families, usually poor themselves, would listen to their hard-luck stories and take them in because they were soldiers. Fully 75% of them came back diseased.

When these men were returned to their organizations for trial after being picked up by the military police, they were usually in a rundown condition, and discipline, however severe, seemed to have little effect upon them. Their clothing was generally tattered and torn and very dirty, and if they had been long absent, it was often filled with vermin. These old clothes were sterilized and then given back in their ragged condition to the men, or, if they were destroyed the delinquent was given any old cast-off uniform, usually a misfit.

Discipline consisted of from one to three, or sometimes six or more months of hard labor. After being given their old, slovenly clothes, they were put at some menial work, such as shovelling coal, kitchen police, or sewer work, and were marched, followed and preceded by armed guards, through the streets of their companies and about the towns, attired in these dilapidated garments or in blue denim overalls, to distinguish them from other soldiers. They were thus made a part of the so-called "prison gang," and treated as criminals, being kept under guard night and day; guards with loaded rifles stood over them while they worked and accompanied them wherever they went. They were ridiculed by other men, disgraced and degraded. They were put on short rations, often reduced to bread and water, as punishment for further misdeeds committed while under sentence. During their time of sentence they lost their drill practice and usually their calisthenics, and they were invariably quartered in close, ill-ventilated and often dark rooms or tents, with cots so close that their bodies almost touched one another. When they had completed their sentences and returned to their companies, they were shunnd and ridiculed by their companions and were down-and-out in their organizations, with the result that they were soon again absent without leave or repeated offences for which they had been convicted.

This was the condition in the Army of Occupation in Germany when I left it in the spring of 1919. It is the condition today in most of the army organizations.

In August, 1920, I visited the American Forces in Germany, and Colonel Peek, who had formerly been adjutant in the 76th Division, who is now "G-4" on General Allen's Staff in Coblenz, and with whom I had often discussed the treatment of delinquents as being inhumane and ineffective, informed me that he had now worked out a plan which was most successful. In November, 1919, he established a disciplinary barracks, about two and one-half miles from Coblenz, on a high plateau overlooking the Rhine. I suggested and he agreed that this disciplinary barracks should hereafter be called the disciplinary school.

We drove out there and Colonel Peek ordered the men to be put thorugh their drill on the parade ground. I never saw finer set-up soldiers than the men of these three companies. They were immaculate in dress and person, and prompt in obeying the orders of their commanding officers. They stood in open ranks while we walked within a foot of each for inspection. They were so straight and immobile it was difficult to believe they were alive. Not an eye turned, and I could not see that a man even winked as we passed by—and these men had heretofore been considered the worst element in the Army, hopeless as to discipline, and not defective enough to be disqualified for service. The majority were men who had been sentenced for absence without leave, and the balance had been guilty of a long list of other delinquencies and crimes.

The physician who had examined them on entrance to this school considered that a large proportion of them were defective. Those whom he found actually feeble-minded, he returned to the States; but those who were classified as "morally defective," he felt should not be returned, as the treatment it was possible to give them there often made them into as good soldiers as there were in the Army.

Now let us follow the prisoner, defective or otherwise, as now handled by Lt.-Col. Peek in the American Forces in Germany:

Soldiers who are absent without leave are picked up all over France and Germany, and other delinquents of various kinds are arrested wherever they may be, and all are sent to their organizations for trial and sentence. All sentences of more than a few hours or a few days must be to the disciplinary school, where they are to serve their full time.

When the prisoner arrives at the school, usually with the oldest uniform the company has to give him—sometimes so flagrant a misfit that the tattered sleeves hang below his hands—he is at once sent to the tailor, where measurements are made for a new uniform. He is then made clean—virtually sterilized—and examined by the doctor, who makes a report as to his condition, mental and physical, including teeth, etc. A new uniform, without insignia, is then issued to him, together with a new and complete outfit, such as is prescribed for every soldier on active duty. This includes materials for keeping boots and gun in proper condition, besides his mess-kit, clothes and toilet articles—tooth brush and powder, hair brush, soap, towels, handkerchiefs, etc. He is given special instruction as to the care of his person, especially his teeth and feet. He is assigned to a light, well-ventilated dormitory, and instructed how to place each article that has been issued to him on his cot in the same position as the like article on every other cot, so that the inspecting officer can, at a glance, determine if any article is missing or in poor condition. In the morning, every bed is made up and the mattress turned half-way down on the bed, the various articles being arranged on this turned-over mattress.

He is then put at whatever work may be indicated as a result of his examination. The men who have been absent without leave are often in a run-down condition, poorly nourished and exhausted. They are given light duties, such as learning to take care of their guns, taking them apart and putting them together again, pressing and cleaning uniforms or other tailor work, or some practical mental training which will come into play in army life. Instead of being deprived of a portion of their rations, or put on limited rations, as many prisoners are, a diet is prescribed which builds them up.

As soon as the newly-arrived delinquent is in "condition," which is usually within a few days or a week, he is put under the regular disciplinary routine. This includes intensive drilling eight hours of every day of the week except two. Of these, one is Sunday, when there are only limited drills to go through; on the other day drilling is neglected only in the afternoon, when all take part in athletic games and sports. Calisthenic exercises are also given, and certain gymnastics from time to time. In the evenings there are recreations and amusements, such as moving pictures, music, etc. As no man is sent here for less than one month, even the shortest-term men are sure to get most valuable intensive training, and when they are returned to their companies, instead of being looked down upon, made butts of and socially shunned, they are among the best-dressed and best set-up men in their organizations, and are respected and often chosen to be drill masters and instructors.

This system has proved to be successful. The school was organized in November, 1919, and when I was there nine months later, 700 men, out of an organization of 15,000 soldiers, had passed through the school, with an average sentence of four months. Of these 700, only 20 had been returned. Those who have passed through often revisit the school, and are quite proud of what they have done there. On the Fourth of July, the men were told in the morning that the day was theirs to do as they pleased. There were to be games and athletics in Coblenz, which they were free to attend, but they must return by a certain hour in the afternoon. About 100 men were serving sentence at that time; all went off on that day and every one returned on time.

I have always held that the defective delinquent should be handled in an entirely different manner from the normal offender, and especially is this so in the case of women. Compare the above-described way of handling defective delinquents with the way defective delinquent women were treated in a Massachusetts prison only a few years ago,—and, for all I know, may still be treated. My attention was called by a former Governor to the fact that young women prisoners, because they would not work at the tasks assigned them or follow out the rules of the institution, which were not made applicable to these defectives, were "spread-eagled" on wire springs covered only with a blanket, tied hand and foot to the edges of the beds, and kept, according to the records, in some instances, 36 hours in this position. This punishment was intended to make the defective "give in." If she gave in, she was released at once; otherwise, not until exhausted. Another humane (?) mode of treatment as carried on in this prison was to lock these girls up like wild animals in special rooms (where they were fed by pushing in bowls of bread and milk or other light diet, through partly opened doors) until their spirit was broken, or until they had become docile and amenable to the will of those in whose power they were.

This class of defectives, neither insane nor feeble-minded, need special study and scientific care and treatment in order to bring out the best that is in them; such treatment as I have described is bound to call out their worst qualities. I have always advocated and do now urge a separate institution or school for the training of this class of persons, that they may be taken out of our prisons, out of our state hospitals and schools for the feeble-minded, and given over to the care of a staff of scientists and teachers, who will not attempt to handle them as a unit, but will study each individual and ascertain just wherein that individual is defective, and then classify them in groups of from one upwards, planning and prescribing the individual needs and treatment of each group, to the end that they may be made useful and at the same time be protected from the irritations and influences their environment brings about in institutions of the prison type above described. Evidently such conditions are also found in Bedford Reformatory, New York; in spite of the claims of this reformatory, as of our Massachusetts prison, of humane treatment given women prisoners, there is quite a large class of defectives of whose needs they are apparently totally ignorant; at any rate, it would appear to be impossible for them to treat these difficult cases intelligently, scientifically and humanely. According to their own statements, they have, after all these years of experience in the care of delinquent girls, only arrived at the primitive method of treating defectives by coercion, punishment, and in some instances, actual cruelty, which they would not be permitted to inflict upon a dog or other animal.

As you all know, our hospitals for the mentally sick, presided over by educated and scientific physicians, would never think of treating these defective cases as they are treated in prisons and reformatories. I remember that, when I was a member of the State Board of Insanity, we sent a small group—three white and one colored—of what were supposed to be incorrigible, defective delinquent girls, who had been passed on from one institution to another, to the superintendent of ons of our state hospitals, with the request that they be specially studied, with a view to developing the best that was in them and of utilizing their tremendous superfluity of physical force with intelligence, which before had been misapplied and misdirected. At first, these girls went through the walls of their rooms as if they had been made of paper, and nearly killed one physician, and committed many delinquencies, moral and criminal, as well as flagrant breaches of discipline. After a month, I visited the hospital and found all happily at work and among the most efficient and best-behaved inmates of the hospital; and this had been accomplished without force or punishment. One, the superintendent told me at the end of the season, had canned more tomatoes than any other patient in the hospital; another was doing some extraordinarily good work on a sewing-machine; and the other two were also doing well, employed according to their personal needs.

Why can not investigation be made of what is being done with this class of offenders in institutions where occupational therapy is specially studied and scientifically applied, as in our Army in Germany, as well as in many of our schools for feebleminded? Then let us urge, as I have before, a school for this special class. I do not believe that there is one of these defectives who has not got some vulnerable point—something in him that will respond to the right care and treatment. But nothing can be gained and nothing has ever been gained by breaking their spirit or their will. They are an enormous expense to the community under present methods, and are continually passed from one institution to another, without receiving treatment of any permanent benefit to themselves, to the institutions, or to the community; and wherever they are, they hamper the work of the institution with the class of inmates for which it is designed.

## Book Review.

*Massage and Exercises Combined.* By ALBRECHT JENSEN. New York: Brooks & Potter. 1920.

In this volume, "Massage and Exercises Combined," the author has described a system of physical training whereby scientific massage movements may be combined with exercises for the development of the human body and physical health. The methods described are simple and may be carried out readily at home. The beneficial results which may be achieved by the application of scientific massage movements in stimulating the nerves, tissues, muscles, organs, vessels, glands, and cells have been found by the author to be much greater than those accomplished by means of general exercises, while he believes that from the balanced and logical combination of massage movements with exercises may be expected the best possible results, not only in the maintenance of health, but also for special therapeutic and physiologic purposes. No gymnastic equipment is required for carrying out the treatment prescribed in this book, and the exercises may be graduated according to individual need and strength. In one chapter are discussed methods of adapting these exercises to diseased and disordered conditions of the body. The author describes the bad effects often resulting from the use of heavy apparatus, weights, and exercises of too strenuous a nature, and explains the construction and characteristics of the combined massage exercises, illustrating them by plates.

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## VACCINATION IN THE LEGISLATURE.

On March 2nd, the Committee on Public Health of the Legislature will hold hearings on two bills dealing with vaccination. In the meantime it is hoped that the Supreme Court will have ruled on the question as to whether a physician's certificate that vaccination would be injurious to a child holds good year after year.

A bill (Senate 221) introduced by the Medical Liberty League provides that any child may attend the public schools, "who presents a written statement signed by a registered physician, parent or guardian, that he is of the opinion that his health will be endangered by vaccination."

The other bill (House 466) introduced by Dr. Alfred Worcester and Dr. George N. Lapham, the presidents of the State Medical Societies, extends the requirement of vaccination to children in private as well as in public schools, "except upon presentation of a certificate signed by a registered physician that the physician has, at the time of giving the certificate, personally examined the child and that he is of the opinion that the physical condition of the minor under fourteen years of age is such that his health will be endangered by vaccination. The said certificate shall state the reasons for the opinion of the physician who signs it, and shall be valid only for one year from the date thereof."

These bills need no further comment. The Medical Liberty League is active in promoting meetings to protest against vaccination. They have headquarters from which much literature is issued. They have advertised in the papers advising parents as to methods whereby their children need not be vaccinated.

Meanwhile it is incumbent on the Medical Profession to explain to the public and to the Legislators the dangers of allowing a large number of persons in any community to remain unvaccinated. A conflagration need not necessarily follow at once on the building of inflammable structures. But smallpox and fire are sure to rage sooner or later if the material is at hand for them to feed upon.

## THE PHYSICAL TRAINING AND SCHOOL NURSES' BILLS.

Last year the Physical Training bill was defeated. Reported favorably by a vote of 16 to 6 in the Committee on Public Health and on Education sitting jointly, it was unanimously reported adversely by the Senate Committee on Ways and Means, a report accepted in the Senate by a vote of 24 to 14.

The arguments against the bill last year were that it would lead to the teaching of birth control and sex hygiene, that it involved centralization of power, and that a requirement of physical training in public schools would automatically impose the same requirement upon private schools.

The bill (Senate 177) reads as follows:

Section 1. School committees of cities and towns or groups of towns shall, not later than September 1, 1922, provide systematic courses of physical training for all pupils in elementary and secondary schools, and may use school buildings and grounds after school hours for this purpose.

Section 2. The Department of Education shall provide courses in the conduct of physical training in the state normal schools and shall assist local school authorities in the promotion of physical training in the public schools and for this purpose may expend during the year 1921, a sum not exceeding one and one-half cents, and thereafter may annually expend a sum not to exceed three cents for each child between the ages of six and eighteen enrolled in the public schools during the preceding school year.

Section 3. The courses of physical training shall consist of organized play, games, indoor and outdoor sports aud athletics and all forms of physical exercise appropriate to the age and physical condition of the pupil.

It is difficult to see any relation in this bill to either sex hygiene or birth control. Clauses in the bill of last year which provided for supervisors of physical training have this year been eliminated. Thus centralization is avoided. As regards the extension of the requirements to private schools the law provides that "school committees shall approve a private school only when the instruction in all the studies required by law is in the English language, and when they are satisfied that such instruction equals in thoroughness and efficiency, and in the progress made therein the instruction in the public schools in the same city or town; but they shall not refuse to approve a private school on account of the religious teaching therein.

The arguments for physical training of children need no presentation here. The appeal which we must make is for a consideration of this bill on its merits. If this is done, the result is certain.

The School Nurses' bill (Senate 239) adds school nurses to the requirement for school physicians. It is as follows:

"The school committee shall appoint one or more school physicians and nurses, shall assign one of each to each public school within its jurisdiction, shall provide them with all proper facilities for the performance of their duties and shall assign one or more physicians to the examination of children who apply for health certificates required by section eighty-seven of chapter one hundred and forty-nine, but in cities where the medical inspection hereinafter prescribed is substantially provided by the board of health, said board shall appoint and assign the school physicians and school nurses."

Under this bill a group of towns might share the services of a school nurse.

Physicians familiar with the good which the school nurses have wrought in many cities and towns must judge for themselves of the merits of this bill. Both this bill and the physical training bill are advocated by the Joint Committee on State and National Legislation of the state medical societies.

## THE PREVENTION OF MALARIA.

It may not generally be appreciated that malaria costs on an average 1,130,000 deaths and more than 100,000,000 cases of illness every year in India alone, and India is only one of a great number of nations which fall within the malarial zone. Malaria in mild form is distributed almost all over the known world; in its malignant form, "it belts the globe in a broad zone, including tropical and semi-tropical regions"; furthermore, more than half of the inhabitants of the earth live where infection is prevalent.

Until recently, the cost of adequate anti-malaria measures has been too great, except in cases where the elimination of malaria was an absolute necessity, to be accomplished regardless of expense, and in large cities where a dense population makes the per capita expense relatively light. A case of the former type was that of the Panama Canal Zone, where for five years, the annual per capita cost was $3.65. In Port Said, satisfactory malaria control was secured at an annual cost of 10 cents per capita; Port Said, however, has 100,000 inhabitants, a population large enough to bear a total expediture which would be prohibitive for towns of from 1,000 to 5,000 inhabitants.

Recent tests in Arkansas and Mississippi, however, have proved that malaria control is economically feasible in towns of 1,000. Four methods were tried: anti-mosquito measures, screening of houses, administration of quinine, and attacking the parasite in the blood of the human carrier. All of these methods gave excellent results. At Crossett, Arkansas, a lumber town of 2,129 inhabitants, where climatic conditions and abundant breeding places favor the propagation of anopheles, and where about 60% of all sickness was due to malaria, which was present in endemic form, the first experiment was tried. Pits and shallow ponds were filled or drained. Undergrowth was cleared away from the edge of running streams, their banks were trimmed, and they were held to narrow channels, with, of course, a swifter current. Other places which could not be drained or filled were cleared of vegetation, opened so as to allow access to small fish (natural enemies of mosquitoes), and oiled weekly with road oil, either by means of automatic drips, or with a knapsack-type sprayer. All artificial containers were removed from the vicinity of the homes, and water barrels on bridges were treated with niter cake. The first result was the apparently almost complete elimination of the mosquito. The actual reduction in malaria, as shown by parasite indices from May to December, 1916, was 72.33%. In 1915, there had been at Crossett 2,500 calls for the services of the local physician in malaria cases. In 1916, there were but 741, a reduction of 70.36%.

Crossett was convinced of the value of anti-malaria measures. It took over the work of mosquito control, and in 1917, succeeded in reducing the number of doctors' calls to 200—less than one a day. In 1918, this was reduced still further, to 73. In three years, Crossett had eliminated 97.1% of its malaria.

The per capita cost of the work the first year was $1.24, omitting over-head expenses, which could not properly be charged against the campaign. The total cost for 1917 was 63 cents per capita; and in 1918 Crossett was kept virtually malaria-free at an expense of 53 cents for each inhabitant. Five other towns were similarly treated with virtually the same results.

The second method—screening houses—was tried in 1916 at a group of plantations along the shore of Chicot Lake, Arkansas. This section was infested with mosquitoes, and had a high malaria rate. A larger number of the houses were negro cabins, often poorly constructed and difficult to screen. Nevertheless, all of the openings in the house were covered with 16-mesh galvanized wire cloth. The tenants were also shown how to keep the screens in good condition, and were warned of the danger of exposure to mosquitoes outside, at night.

From May to December the reduction in malaria, based on the parasite-index method, was 70.6%. The average cost of screening each house was $14.59, and, as the screens easily last two years, the average annual cost was $7.30, and the cost per capita, $1.75.

In another group of plantations, which lay along a sluggish bayou where mosquitoes bred plentifully, the immunizing quinine method was tested. Each adult in the community was given 10 grains of quinine daily—five in the morning and five in the evening—for two successive days each week. For children under 15, the dose was one grain for each three years of their age. Parasite indices taken in May and December of the year 1916 showed a malaria reduction of 64.45 per cent., at a per capita cost of 57 cents.

The final method of malaria control is to destroy the parasites in the blood of the carriers. This was first suggested by Dr. Robert Koch, the famous German physician and discoverer of the tubercle bacillus, during a visit to Italy in 1898, and first demonstrated by him in Stephansport, German New Guinea, in 1900, where he materially reduced the malaria rate in this little town of 734 persons. During 1916 and 1917, this method was tested among more than 30,000 people in Bolivar County, Mississippi. Ten grains of quinine a day for eight weeks was found sufficient to sterilize the blood of about 90% of the persons to whom it was administered. In 1918, the test was applied to Sunflower County, Miss. "This area," says the report of the experiment, "like the delta region in the heart of which it lies, is level, low-lying, and covered at frequent intervals with a net-and-patchwork of sluggish streams, bayous and swamps . . . a typical rural area." About 9,000 people live in the 100 square miles selected for the demonstration: 1,000 in the town of Ruleville and 8,000 on the cotton plantations.

There are about four times as many negroes as white people in the test area. From one-third to three-fourths of the people on the plantations are estimated to have one or more attacks of malaria annually. Of an annual doctor's bill of $4,000 for one plantation with 600 tenants, $3,000 was chargeable to the one disease. A census was taken, showing that 40% of the rural population had had malaria within twelve months, and that, of the remaining 60%, 22% had the parasites in their blood. All persons who had had malaria and who were carrying parasites, were given 10 grains of quinine a day for eight weeks. It has been estimated by the directors of this work that approximately 80% control has been established over malaria.

These experiments point the way to action.

In South Georgia the American Red Cross has been conducting an intensive anti-malaria campaign, in coöperation with the State Board of Health, the Georgia Association, the U. S. Public Health Service and several large corporations. The tests have shown that where mosquito control is feasible, it unquestionably is practical. It is evident that it pays both in direct saving of money and in greater efficiency, to put into effect one or more of the anti-malaria measures. All that is needed is the willingness to be shown, and expert advice; the one must come from the people, but the other is to be had for the asking.

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## AMERICAN WELFARE WORK IN PARIS.

The model American "settlement house" established by the American Red Cross, in 1917, in the heart of the very poor districts in Paris, where the average child mortality has been between 30 and 40% for many years, has been making remarkable progress in its campaign against disease and death. Of 1127 nursing infants treated at the Red Cross foundation during a period of ten months, only 39 died. Under ordinary circumstances, probably, 394 of these children would have succumbed. The total mortality among the children cared for by the institution has been 3% as against 40% for the other children of the same district—the 19th Ward.

This settlement house has been adopted by the French as a model for the future organization of all "medico-social" service in France. A French society, headed by Madame Raymond Poincarè, has undertaken to supply the finances for the continuation of the work in Paris' poorest district, and, at the same time, to spread abroad the doctrines of social welfare as practised in America and exemplified in the work of the 19th Ward Social Center.

For the first time, France has seen, through this settlement house, a practical demonstration of American "medico-social" methods. Until the coming of the Red Cross foundation, the French social service worker and the public dispensary practitioner never met. There was no idea of combining home betterment and medical aid to achieve a common end of disease prevention. With the establishment of its American plan Social Center in Paris, the Red Cross has pointed the way to a new idea for France in public welfare organization which Frenchmen have not been long in appreciating and undertaking. Although the institution is now in the hands of a society of French philanthropists, it has retained throughout the methods initiated by its American organizers.

Exactly as in similar institutions in America, the Paris Social Center sends its visiting nurses out to educate the prospective mothers and sees that the mothers are properly attended during the confinement period; in addition, the organization makes itself a virtual guardian of the baby's health, keeping a record of each child's progess up to the age of 16 years, furnishing the mother with practical demonstrations of the essentials of child hygiene, providing medical attention in case of need, and, through its visiting nurses, observing conditions among families. For the ailing and backward children of the ward an American kindergarten has been installed.

Between the months of July, 1919, and May, 1920, the Social Center of the 19th Ward provided 462 medical clinics for its charges. These clinics were attended by 9,016 mothers and children. The institution's social workers and nurses made 16,160 home visits and inspections during this period.

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## MEDICAL NOTES.

British Honors to the Medical Profession.—Among the honors included in the New Year Honors List this year, the recognition of medical journalism by the conference of knighthood on the editors of the *Lancet*, and of the *British Medical Journal* is of particular interest, as this is the first instance in which medical journalism has been granted this distinction. Sir Dawson Williams, C.B.E., M.D., D.Sc., F.R.C.P., editor of the *British Medical Journal*, and Sir Squire Sprigge, M.A., M.D., editor of the *Lancet*, have received the honor of knighthood.

Appointment of Dr. Oscar Klotz.—Announcement has been made of the appointment of Dr. Oscar Klotz, Professor of Pathology in the University of Pittsburgh Medical School, as representative of the International Health Board of the Rockefeller Foundation for medical research work and education in São Paulo, Brazil, serving as director of a pathologic institute.

The Lettsonian Lectures.—The first of the Lettsonian Lectures before the Medical Society of London was delivered on February 7, 1921, by Mr. G. E. Gask. On February 21 and March 7, Mr. Gask will speak on "Surgery of the Lung and Pleura," the subject of the lectures this year.

### BOSTON AND MASSACHUSETTS

Week's Death Rate in Boston.—During the week ending February 12, 1921, the number of deaths reported was 201 against 508 last year, with a rate of 13.84 against 32.77 last year. There were 23 deaths under one year of age against 68 last year.

The number of cases of principal reportable diseases were: Diphtheria, 74; whooping cough, 19; scarlet fever, 77; typhoid fever, 1; measles, 113; tuberculosis, 36.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 2; typhoid fever, 1; measles, 14; tuberculosis, 7.

Total deaths from these diseases were: Diphtheria, 3; whooping cough, 3; scarlet fever, 1; tuberculosis, 19.

Included in the above were the following non-residents: Tuberculosis, 1. Encephalitis lethargica: cases, 8; death, 1.

Boston Medical Library.—The annual meeting of the Boston Medical Library was held January 11, 1921. The officers of 1920 were reelected and reports were received from the executive committee, the librarian and the treasurer. The Library now contains 106,892 books and 85,291 pamphlets and it has been used during the year 1920 by an increased number of readers while the halls and rooms have been occupied by 61 different society meetings, with a total attendance of 3,488. The collection of foreign books and periodicals is now very complete owing to the recent trip of the assistant librarian to Europe. The librarian showed some of the recent and more valuable accessions and the assistant librarian read a paper on "Some Personal Experiences on a Medical Book-buying Trip in Germany in the Spring of 1920."

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The next annual meeting of the Massachusetts Medical Society will be held in Boston, Tuesday, May 31, and Wednesday, June 1, 1921.

## The Massachusetts Medical Society.

### STATED MEETING OF THE COUNCIL.

February 2, 1921.

A stated meeting of the Council was held in the Boston Medical Library, Wednesday, February 2, 1921, at 12 o'clock, noon. The President, Dr. Alfred Worcester, was in the chair and the following ninety-two councilors present:

Berkshire,
A. P. Merrill.
Bristol North,
W. O. Hewitt.
Bristol South,
W. A. Dolan.
Essex North,
R. V. Baketel.
J. F. Burnham.
G. E. Kurth.
F. D. McAllister.
F. B. Pierce.
Essex South,
W. G. Phippen.
J. F. Donaldson.
H. K. Foster.
W. T. Hopkins.
J. F. Jordan.
G. M. Kline.
A. N. Sargent.
R. E. Stone.
Franklin,
G. P. Twitchell.
Hampden,
J. M. Birnie.
M. B. Hodskins.
Middlesex East,
C. E. Ordway.
Middlesex North,
W. B. Jackson.
M. I. Tighe.
Middlesex South,
H. T. Baldwin.
A. W. Dudley.
F. J. Goodridge.
F. R. Jouett.
E. H. Stevens.
John Duff.
Godfrey Ryder.
C. H. Staples.
C. E. Mongan.
G. W. W. Whiting.
C. A. Dennett.
W. E. Fernald.
Alfred Worcester.
F. R. Stubbs.
C. E. Hills.
G. A. Bancroft.
E. H. Bigelow.
A. K. Stone.
Fresenius Van Nüys.
Norfolk,
D. N. Blakely.
F. L. Brearton.
Norfolk (*cont.*)
E. H. Brigham.
A. N. Broughton.
W. L. Burrage.
H. T. Holland.
G. W. Kaan.
W. B. Keefer.
Bradford Kent.
M. V. Pierce.
Victor Safford.
G. H. Scott.
Augusta G. Williams.
Norfolk South,
C. S. Adams.
Fred E. Jones.
Plymouth,
W. C. Keith.
C. E. Lovell.
Gilman Osgood.
F. G. Wheatley.
Suffolk,
J. W. Bartol.
F. J. Cotton.
Loretta J. Cummins.
Lincoln Davis.
Channing Frothingham.
W. J. Gallivan
G. S. Hill.
W. C. Howe.
J. J. Minot.
W. H. Robey, Jr.
Stephen Rushmore.
C. L. Scudder.
C. M. Smith.
J. S. Stone.
Louisa P. Tingley.
F. H. Williams.
Worcester,
F. H. Baker.
W. P. Bowers.
W. J. Delahanty.
G. E. Emery.
M. F. Fallon.
Homer Gage
R. W. Green.
A. G. Hurd.
C. B. Stevens.
G. O. Ward.
F. H. Washburn.
S. B. Woodward.
Worcester North,
W. E. Currier.
E. L. Fiske.
J. G. Henry.
W. F. Sawyer.

There being no corrections offered, the minutes of the last meeting were adopted by vote as printed in The Boston Medical and Surgical Journal. The Secretary stated that a volume of records of the Council, 1909-1920—the first loose-leaf book to be used—had been finished, and he offered it for inspection by the

Councilors. Dr. S. B. Woodward presented the report of the Committee on Membership and Finance as to Membership and it was voted to accept it and adopt its recommendations.

### REPORT OF THE COMMITTEE ON MEMBERSHIP AND FINANCE, AS TO MEMBERSHIP.

The Committee on Membership and Finance makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire, under the provisions of Chapter I, Section 5, of the by-laws:

Wilfred Baxter Bancroft, 597 Broadway, South Boston.
George Danforth Bliss, 508 Washington St., Dorchester.
George Wells Brace, Westfield, Mass., with remission of dues for 1918, 1919 and 1920.
Charles Allen Davis, South Dennis.
John Arthur Tenney, 151 Huntington Ave., Boston.
Levi White, 11 Henshaw St., Worcester.
Arthur Bennett Morong, 12 Blackwood St., Boston.

2. That the following named Fellows be allowed to resign under the provisions of Chapter I, Section 7, of the by-laws:

Parker Burnham, 15 Western Ave., Gloucester.
Alphonso Holland Carvill, 28 Highland Ave., Somerville.
Albert Ulysses Franklin Clark, 690 Congress St., Portland, Maine.
Arthur Dixon, 28 Pleasant St., Worcester.
Arthur Brewster Emmons, 2nd, Dover.
Arthur Willard Fairbanks, 186 Temple St., West Roxbury, with remission of dues for 1920.
George Wells Fitz, 114 N. Clara Ave., Deland, Florida.
Charles William Galloupe, 374 Commonwealth Ave., Boston.
William Ellsworth MacPherson, Watertown Arsenal, Watertown.
Howard Osgood, 469 Franklin St., Buffalo, N. Y.
John Donald Proctor, 61 Winter St., Keene, N. H.
Thomas Melville Proctor, South St., Wrentham.
Frederick Stocker Raddin, 25 County Road, Chelsea.
Beatrice A. Reed Chatigny, 31 Standish St., Dorchester.
Myra D. Allen Ruppel, 4th Field Artillery, Camp Stanley, Texas.
Robert Bass Scales, The Claymoor, St. Petersburg, Florida.
Albert Atherton Taft, Keene, New Hampshire.
Hubert Granville Wilbur, Long Beach, California.
McIver Woody, College of Medicine Univ. of Tenn., Memphis, Tenn.
Dennis Francis O'Connor, Broad St., Newark, N. J.
Martin William Peck, Towson P. O., Md., with remission of dues.
Arthur Howard Wentworth, 77 Browne St., Brookline, as of January 1, 1920.

3. That the dues of the following Fellows for 1920 be remitted as they were still in the Service of the United States during a part, or the whole of that year:

Clarence Edward Burt, New Bedford.
Edward Richard Gookin, 799 Columbia Road, Dorchester.
James Joseph Regan, *U. S. S. Relief*, Navy Yard, Philadelphia.

4. That the following named Fellow be deprived of the privilege of membership, as provided by Chapter I, Section 8, of the by-laws:

William David Hilliard, Medical Bldg., Asheville, N. C.

5. That the following named Fellows be allowed to change their district membership without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws:

Frank William Marvin from Middlesex South to Suffolk.
Forrest Bertram Ames from Norfolk to Suffolk.
Harry Archibald Nissen from Norfolk to Suffolk.

Respectfully submitted,
SAMUEL B. WOODWARD,
*Chairman, Committee on Membership and Finance.*

Dr. Woodward read the estimate of the Committee of Arrangements as follows:

### ESTIMATE OF COMMITTEE OF ARRANGEMENTS.

January 12, 1921.

Dr. Samuel B. Woodward,
Worcester, Mass.

Dear Dr. Woodward:

I am sending you a statement of the appropriation needed by my committee for the Annual Meeting of the Massachusetts Medical Society this year. I have been somewhat delayed in making up the estimate as the conditions of the dinner this year are so different from those of the last few years that it is difficult to estimate the proper number that will be present, but inasmuch, however, as I understand there will be no charge for the dinner, I am figuring on the basis of nine hundred to a thousand. Taking the latter figure, my estimate will be as follows:

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|---|---|
| A thousand dinners at $2.50 each.... | $2,500 |
| Cigars ............................... | 280 |
| Supper after the Shattuck Lecture .. | 75 |
| Printing dinner tickets, help, police, and other incidentals ............. | 100 |
| | $2,955 |

Very truly yours,
CHARLES H. LAWRENCE,
*Chairman, Committee of Arrangements.*

The Secretary read the report of the committee appointed to consider the petition for restoration to the privileges of fellowship of Thomas Brinsley Foley, and it was voted to adopt the recommendations of the report that Dr. Foley be restored upon the carrying out of the conditions imposed. He read a petition from Fred Drew of Boston to be restored and the following committee was appointed by vote, on nomination by the chair, to consider it: E. G. Brackett, F. J. Cotton, E. B. Young. The chair announced the death on January 23, 1921, of Edward Henry Bushnell, of Quincy, Councilor and President of the Norfolk South District Medical Society, at the age of fifty-five.

The President nominated and the Council appointed the following delegates and alternates to the House of Delegates of the American Medical Association for terms of two years, from June 1, 1921:

| *Delegates* | *Alternates* |
|---|---|
| F. B. Lund, Boston | W. H. Robey, Boston |
| E. F. Cody, New Bedford | F. W. Anthony, Haverhill |

The following were appointed delegates to the annual meetings of State Medical Societies:

*Maine:* E. G. Hoitt, A. W. Dudley.
*New Hampshire:* G. E. Whitehill, J. A. Mehan.
*Connecticut:* E. A. Codman, J. L. Ames.
*Rhode Island:* W. A. Dolan, F. S. Churchill.

Dr. A. K. Stone read the report of the Auditing Committee, the Treasurer's report and financial statements by the Certified Public Accountant (See Appendix). On motion from the floor, duly seconded, it was *Voted*, That the reports be accepted and placed on file.

Dr. S. B. Woodward read the report of the Committee on Membership and Finance, as to finance with the Budget (See Appendix). He explained the provisions and called attention to the inconsistency of some of the standing committees paying mileage and others not paying the railway fares of their members. He pointed out that it was for the Council to decide as to the disposition of the estimated balance of $7,500 that would be left in the treasury, according to the Budget. On motion, duly seconded the report and the budget were adopted and ordered placed on file.

Dr. W. A. Dolan queried how long the Society would be required to pay the additional cost of The Boston Medical and Surgical Journal. Dr. Woodward replied that the Committee of Nine would report when they would be ready to take over the Journal; they had recommended $15,000 as the amount of money they will require to manage the Journal; that the original estimate was based on the estimated expense as given by the old proprietors.

The Chair stated that if the Council wanted to have the annual dinner without expense to the diners it would be necessary to appropriate $2,955, as estimated by the Committee of Arrangements, leaving $4,545 to be distributed to the District Medical Societies as a dividend; but that if every fellow who partook of the dinner was to pay for his meal, there would be more to distribute as a dividend. Dr. G. W. Kaan said that he was treasurer of the Norfolk District Medical Society and was interested to provide as good entertainments for his society as possible. This year they had asked the members of that district to subscribe an additional dollar to help pay the expenses of their meetings; the expenses of everything had increased and the cost of the six meetings of his district was excessive. He thought that other districts should have well attended meetings, and that the money of the Society was better expended for such uses, than for a dinner for the parent society in Boston that only a limited number would attend. He moved that the sum of $6,000 be appropriated as a dividend to the district societies and $1500 for the annual meeting. The motion was seconded. Dr. A. P. Merrill asked what the extra $1,000 would be saved for. He thought that this was a year when the districts would want that extra thousand and it would be preferable to appropriate it now rather than for another year when the prices would be lower. Dr. Kaan accepted Dr. Merrill's amendment and the motion as amended, namely that $7,000 from the estimated balance in the treasury, be appropriated as a dividend to the district medical societies, and $500 appropriated as a dividend from the same balance for the use of the Committee of Arrangements for the annual meeting, was put by the chair. Dr. Woodward warned the district societies that they could not expect to receive so large an amount in future years; that in the past the largest amount appropriated had been $4,500. Dr. J. M. Birnie said he spoke for the Hampden District Medical Society. His society wanted all the money it could get in order that a little lunch might be provided, especially for the members who came from Holyoke and Westfield; if the members could be kept together they could talk about the affairs of the Society and keep up interest also in the local organization. The chair thought that a dinner of the entire Society was an important factor in promoting sociability and coöperation; that this year the Committee of Arrangements had planned for a large mid-day dinner at the Copley-Plaza Hotel; that the district societies should be satisfied with a reasonable sum and not nearly twice what they had received in the past. There being no further discussion, the motion as amended was put, seconded and carried.

Dr. J. S. Stone read the following report of the Committee of Nine:

### Report of the Committee of Nine.

The Committee has unanimously chosen Dr. Walter P. Bowers of Clinton to be the Managing Editor of the Boston Medical and Surgical Journal, as soon as it is taken over by the Society.

Negotiations for the transfer of the Boston Medical and Surgical Journal to the Society are under way and as soon as certain legal technicalities are complied with the transfer will be made, probably within a fortnight.

The counsel of the Committee of Nine advised specific authorization in the charter of the Society for the publication of a journal, in order that there might never be any question of the legality of this action. A bill was therefore introduced in the House of Representatives on petition of Alfred Worcester, Homer Gage, S. B. Woodward, George W. Gay, and Walter P. Bowers, seeking an enlargement of the powers of the Massachusetts Medical Society, specifically allowing it to publish a journal. This action had to be taken before January 15th, if it was to come before the present session of the Legislature. As such requests should properly originate with the Society rather than with any officers of the Society, the Committee requests approval of the action of the petitioners and a formal vote requesting of the Legislature the passage of House Bill No. 1121, enlarging the powers of the Massachusetts Medical Society and authorizing the publication of a journal.

James S. Stone, *Secretary.*

House Bill No. 1124.

Bill to enlarge the powers of the Massachusetts Medical Society.

Section 1. The Massachusetts Medical Society is authorized to engage in the publication and distribution of a journal or periodical to be devoted mainly to medical and surgical science.

Section 2. This act shall take effect upon its passage.

The foregoing bill has been filed with the Clerk of the House on the petition of Alfred Worcester and others.

*Voted,* To accept the report.

Dr. J. S. Stone *moved,* That the Council approve the action of Alfred Worcester, President of the Massachusetts Medical Society, and others, in petitioning the Legislature to enlarge the powers of the Massachusetts Medical Society under its charter, and authorize it to publish a journal, and directs the Joint Committee on State and National Legislation to favor the enactment of House Bill No. 1124, which provides this authority. The motion being seconded, was passed unanimously.

Dr. Homer Gage said that the preliminary report of his Committee of Nine had been presented to the Council last October; that the committee had held many meetings, one of them being with the presidents of the district societies so that the committee might have the advice of these officers before taking over the Journal. After deciding to take it over, the hitch had been the difficulty of finding somebody who thought he could manage the Journal to the satisfaction of the Society and they had finally made up their minds that if there was any man who could do it, that man was Dr. Bowers. They did not know whether he could take up the new task in addition to his duties at the State House. He finally yielded to the committee because he felt it was his duty, and the committee feel that it is a very fortunate outcome that the Journal will start out under very satisfactory auspices, and we predict that it will be successful.

Dr. A. K. Stone presented the report of the committee appointed at the last meeting to examine the papers of the Society in the vault at the building of the Boston Medical Library:

Report of the Committee on Papers in the Vault.

We would respectfully report that each member of the committee spent some time looking over the papers belonging to his department. Subsequently the whole committee met and unanimously voted the destruction of certain papers belonging to the Society, which, in their judgment, were deemed of no value, and they rearranged the remaining papers. The Librarian saw to the destruction of the worthless ones at a later time.

By this action the number of documents in the vault of the Library is materially reduced and there is room in the chests belonging to the Society to care comfortably for the records which are of value and the material which will necessarily collect from year to year until a similar committee is again appointed.

A. K. Stone,
W. L. Burrage.
E. H. Brigham.

The report was accepted and placed on file.

Dr. E. H. Bigelow reported on Maternity Benefits for the standing committee of the Society, on Public Health. He said he considered the bill a public health measure, that his committee had had a meeting on January 31, 1921, at which it was voted to endorse the principles contained in the bill on Maternity Benefits filed with the Legislature by the State Commission on Maternity Benefits. He moved the adoption of that vote by the Council. Dr. Bowers seconded the motion saying that he believed that the Councilors of the Massachusetts Medical Society should stand up in a body and uphold the efforts of the president of that society as chairman of the commission to improve the obstetric situation in the State; few realized the amount of time that had been expended in the duties of the office; the Governor had honored the Society in appointing its president to the position and the State was honored in the service that had been given; it was a very important matter and he hoped the motion would prevail. The motion was favored by Dr. E. L. Fiske and by Dr. Woodward, and opposed by Dr. Dolan on behalf of the Bristol South District and by Dr. Mongan. After a lengthy discussion in which portions of the bill as presented by the Commission, were read and commented on by Dr. Bowers, following allegations by Dr. Dolan that the bill was paternalistic, communistic and socialistic, Dr. Dolan moved that the motion be laid on the table, and it was so voted by a two-thirds majority, in a show of hands.

Dr. J. S. Stone said that the Commission on Maternity Benefits had issued a challenge to the medical profession. They have stated that approximately forty per cent. of deaths of mothers every year are preventable. They have stated that approximately forty per cent. of deaths in early infancy are preventable. They have stated that this problem is medical and not social. In view of these statements he introduced the following motion:

*Moved:* That a committee of seven be appointed by the President for the purpose of studying any measures for Maternity and Infant Welfare and to take such action and make such recommendations to District Societies, to the Council and in the columns of the Boston Medical and Surgical Journal as may from time to time be approved; said Committee being authorized to add to its membership, representatives of the Homeopathic Medical Society, and being directed to present a report of its actions and recommendations at the next regular meeting of the Council.

After the motion had been discussed and amended as regards where recommendations should be made, it was passed as printed:

The President appointed the following committee:

J. S. Stone, Boston.
C. E. Mongan, Somerville.
Richard Dutton, Wakefield.
W. P. Bowers, Clinton.
Thomas Almy, Fall River.
Brace W. Paddock, Pittsfield.
R. L. DeNormandie, Boston.

Dr. Dolan moved that the Secretary make known to the committee of the Legislature having charge of the bill introduced by the Commission on Maternity Benefits, the action of the Council in laying on the table Dr. Bigelow's motion to approve the principles embodied in that bill. The motion being seconded was put to a vote and lost.

Dr. J. S. Stone said that he would like to speak of a vote taken at a recent meeting of the joint committees of the Massachusetts Medical Society and Massachusetts Homeopathic Medical Society on State and National Legislation to the effect that the Secretary of the Massachusetts Medical Society be asked to notify the secretaries of the district medical societies that the joint committee was in favor of setting aside one meeting of each district society every year for the consideration of legislation, preferably the meeting in the month of February. No action was asked.

Dr. G. O. Ward offered the following preamble and resolution:

*Whereas,* it seems unwise that there should exist any discrepancy between the statutes of the Commonwealth of Massachusetts pertaining to the Massachusetts Medical Society and the By-Laws of said Society by which the election of officers is ordered. Therefore be it

*Resolved,* that Chapter IV, Section 3, of the By-Laws be so amended that the last sentence of paragraph one shall read: "Councilors only, shall be eligible to the offices above named," *viz.,* president, vice-president, secretary, treasurer and librarian, thus conforming the By-Laws to the Statutes, 1803, Chapter 85, Section 3. Digest, Article V, paragraph 3, which provides that the Councilors shall "appoint, from among themselves, a president, and such other officers of the said corporation as are to be so appointed."

It was moved and seconded that the amendment be approved, and it was so voted.

Dr. Ward offered the following amendment to Chapter I, Section 2, of the By-Laws: After the words "fiscal year," line two, insert in parenthesis marks "except as hereafter provided in Section 6 of this chapter."; also Chapter I, Section 6. The last sentence of paragraph one shall read: "The assessment paid by fellows who are admitted to the society following the November examinations, shall be that fixed for the next succeeding fiscal year, and shall cover the dues both for the current year and for the next fiscal year."

These two amendments were approved by vote.

The president nominated and the Council appointed Dr. M. B. Hodskins, of Palmer, a member of the committee to coöperate with the Massachusetts Federation of Teachers *vice* Dr. Annie Lee Hamilton, resigned.

Dr. Woodward called attention to the terms of Article X of the Digest of the Society, which provide that the Society may hold any property that it may receive, in value not exceeding the sum of two hundred pounds and the annual income or interest of such property shall not exceed the sum of six hundred pounds; "all the sums mentioned in this act (St. 1781, Ch. 15, Sec. 9) to be valued in silver at six shillings and eight pence per ounce." If the pound be considered at the present rate of exchange, the Society is getting more income than it is entitled to. He thought that the act referred to the Massachusetts pound, which was worth $3.33 1/3. He would like to have the attention of the Committee on State and National Legislation called to this matter, because if the Society should receive a large bequest it might not be authorized to take the income from it. He moved and it was voted that the matter be referred to the Committee on State and National Legislation.

Dr. Woodward called attention to a vote of the Council of June 5, 1828, nearly one hundred years ago, with reference to the Permanent Fund of the Society. The Society had received in 1810 a gift from the Commonwealth of a township of land in the District of Maine, six miles square, because, as it was said, the Society had incurred expenses and devoted a considerable portion of time to the "promotion of the laudable objects of their institution." This township was sold in 1823 and formed the basis of the Permanent Fund. The vote of June 5, 1828, was as follows: "That the Treasurer be directed to pay to the Massachusetts Hospital Life Insurance Company, in trust for the Massachusetts Medical Society, all monies which he may now hold, or may hereafter receive, belonging to the permanent fund of said society; the same to accumulate at compound interest, and to be subject to withdrawal at the most frequent periods allowed by the rules of said company, upon a regularly certified vote of the Counsellors of said society." He moved and it was *Voted,* That the above vote of June 5, 1828, be and it is hereby rescinded.

Adjourned at 1.40 P.M.

Walter L. Burrage, *Secretary.*

# APPENDIX.

## REPORT OF AUDITING COMMITTEE.

*To the President and Councilors:*

We have examined the securities of the Society in the custody of the Treasurer in the vaults of the Bay State Branch of the Old Colony Trust Company; we find them in accordance with the Treasurer's schedule of investments.

The report of audit of the Treasurer's accounts by Horace C. Hartshorn, Certified Public Accountant, for the year ending December 31, 1920, we have also examined and accepted, and submit it herewith as a part of our report.

C. J. McCormick,
Charles M. Green,
*Auditors.*

Boston, January 18, 1921.

Dr. C. J. McCormick, Dr. Charles M. Green,
Audit Committee, Massachusetts Medical Society,
Boston, Mass.

*Gentlemen:*

In accordance with your instructions I have audited the books and accounts of your Treasurer, Dr. Arthur K. Stone, for the year ending December 31, 1920, and enclose herewith,

| | |
|---|---|
| *Schedule A* | Statement showing the Assets and Liabilities of the Massachusetts Medical Society, December 31, 1920. |
| *Schedule B* | Statement showing the Profit and Loss Account of the Massachusetts Medical Society for the year ending December 31, 1920. |

The cash on deposit with the banks has been reconciled with the bank statement and found to be correct. Disbursements have been verified, postings to the ledger checked, and trial balance found to be in balance. I have not examined the securities in the safe deposit vaults of the Society.

Respectfully submitted,
Horace C. Hartshorn,
*Certified Public Accountant.*

## TREASURER'S REPORT.

### Showing the Assets and Liabilities of the Massachusetts Medical Society

### December 31, 1920

*Schedule A.*

ASSETS.

| | | | |
|---|---|---|---|
| *Cash:* | | | |
| New England Trust Co. .... | | $2,689.98 | |
| Old Colony Trust Co. ..... | | 3,365.11 | $6,055.09 |
| *Investments:* | | | |
| Shattuck Fund | | | |
| Annuity Policy Mass. Hospital Life Ins. Co. ...... | | 9,166.87 | |
| Phillips Fund | | | |
| Mass. 3½% Gold Bonds . | | 10,000.00 | |
| Cotting Fund | | | |
| Deposit in Institution for Savings in Roxbury and Vicinity ................ | | 1,000.00 | |
| Deposit in Provident Institution for Savings in the Town of Boston ......... | | 1,000.00 | |
| Deposit in Suffolk Savings Bank for Seamen and Others, Boston .......... | | 1,000.00 | |
| Permanent Fund | | | |
| Annuity Policy Mass. Hospital Life Ins. Co. ........ | | 11,253.30 | |
| Mass. 3½% Gold Bonds . | | 6,000.00 | |
| Deposit in Franklin Savings Bank of the City of Boston ................. | | 1,074.48 | |
| Liberty Bonds | | | |
| Fourth Issue 4¼% due Oct. 15, 1938—Par value $5,200 ................. | | 5,043.23 | $45,537.88 |
| Cost $5,000.00 1st 3½% Bonds sold for $4,603.75 but showing on the books at .......... | $5,000.00 | | |
| Cash in addition ......... | 43.23 | | |
| Total ........ | $5,043.23 | | |
| Total ...................... | | | $51,592.97 |

LIABILITIES.

| | | |
|---|---|---|
| *Endowment Funds:* | | |
| Shattuck Fund (G. C. Shattuck, 1854, Balance, 1866) | $9,166.87 | |
| Phillips Fund (Jonathan Phillips, 1860) ............ | 10,000.00 | |
| Cotting Fund (B. E. Cotting, $1,000.00, 1876, 1881, 1887).. | 3,000.00 | $22,166.87 |
| *Surplus:* | | |
| Balance, January 1, 1920 .. | 26,862.23 | |
| Year ending December 31, 1920 *Schedule B* .......... | 2,563.87 | 29,426.10 |
| Total .................... | | $51,592.97 |

### STATEMENT SHOWING THE CURRENT INCOME OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE YEAR ENDING DECEMBER 31, 1920.

*Schedule B.*

CREDIT.

| | | |
|---|---|---|
| Assessments paid to District Treasurers: | | |
| Barnstable | $178.00 | |
| Berkshire | 526.00 | |
| Bristol North | 348.00 | |
| Bristol South | 783.68 | |
| Essex North | 1,087.00 | |
| Essex South | 1,240.00 | |
| Franklin | 215.40 | |
| Hampden | 1,271.50 | |
| Hampshire | 348.00 | |
| Middlesex East | 414.00 | |
| Middlesex North | 504.00 | |
| Middlesex South | 3,107.00 | |
| Norfolk | 2,880.00 | |
| Norfolk South | 345.20 | |
| Plymouth | 558.00 | |
| Suffolk | 4,297.00 | |
| Worcester | 1,641.00 | |
| Worcester North | 458.00 | $20,201.78 |
| Assessments paid to Treasurer | | 1,653.10 |
| Contribution of Homeopathic Medical Society to Committee on State and National Legislation | | 80.00 |
| Income Shattuck Fund | | 412.51 |
| Income Phillips Fund | | |
| Mass. 3½% Gold Bonds | | 350.00 |
| Income Cotting Fund | | |
| Interest—Institution for Savings in Roxbury and Vicinity | 42.50 | |
| Interest—The Provident Institution for Savings | 45.00 | |
| Interest—Suffolk Savings Bank | 42.50 | 130.00 |
| Income Permanent Fund | | |
| Annuity Policy Mass. Hospital Life Ins. Co. | 506.40 | |
| Massachusetts 3½% Bonds | 210.00 | |
| Interest—Franklin Savings Bank | 48.32 | |
| Liberty Bonds | 145.83 | 910.55 |
| Income from Deposits in Banks | | |
| New England Trust Co. | 179.02 | |
| Old Colony Trust Co. | 90.57 | 269.59 |
| Total | | $24,007.53 |

DEBIT.

| | | | |
|---|---|---|---|
| General Expense | | | |
| President's Expense | $100.00 | | |
| Secretary's Expense | 1,169.54 | | |
| Treasurer's Expense | 89.65 | | |
| Librarian's Expense | 67.24 | | |
| District Treasurers' Expense | 1,228.75 | | |
| Supervisors' Expense | 26.69 | | |
| Censors' Expense | 844.25 | | |
| Rent | 750.00 | | |
| Salaries | 2,000.00 | | |
| Delegates' Expense | 500.00 | | |
| Bank Charges | 1.72 | 6,777.81 | |
| Boston Medical and Surgical Journal Guarantee | | 9,756.50 | |
| Shattuck Lecture | | 200.00 | |
| Committee Expense | | | |
| Arrangements | 498.32 | | |
| Ethics and Discipline | 5.60 | | |
| Medical Education and Medical Diplomas | 138.20 | | |
| Membership and Finance | 7.16 | | |
| State and National Legislation | 375.12 | | |
| Public Health | 643.87 | | |
| Health Insurance | 13.70 | 1,681.97 | |
| Annual Dividends to District Societies | | 2,000.00 | |
| Defense of Malpractice Suits | | 685.02 | |
| Cotting Lunches | | 312.33 | $21,443.66 |
| Balance to Surplus | | | $2,563.87 |

Respectfully submitted,
ARTHUR K. STONE, *Treasurer.*

### Reconciliation Between the Profit and Loss and Budget for the Year Ending December 31, 1920.

| | | Profit and Loss Account | Budget Estimate | Difference Under Estimated | Difference Over Estimated |
|---|---|---|---|---|---|
| Revenue: | | | | | |
| Assessments | $21,854.88 | | | | |
| Investments | 2,072.65 | | | | |
| Total Society Revenue | | $23,927.53 | $22,600.00 | $1,327.53 | |
| Contribution by Homeopathic Society to Com. on State and National Legislation | | 80.00 | | 80.00 | |
| Increase in Revenue over Budget | | | 1,407.53 | $1,407.53 | |
| Total as per Auditor's Report | | $24,007.53 | $24,007.53 | | |
| Expenses: | | | | | |
| Salaries of Officers | | $2,000.00 | $2,000.00 | | |
| Expenses of Officers: | | | | | |
| President | | 100.00 | 100.00 | | |
| Secretary | | By-laws<br>1,169.54 | 350.00<br>750.00 | 69.54 | |
| Treasurer | | 89.65 | 200.00 | | 110.35 |
| Librarian | | 67.24 | 50.00 | 17.24 | |
| District Treasurers | | 1,228.75 | 1,200.00 | 28.75 | |
| Supervisors | | 26.69 | 30.00 | | 3.31 |
| Censors | | 844.25 | 300.00 | 544.25 | |
| Delegates | | 500.00 | 300.00 | 200.00 | |
| Rent | | 750.00 | 750.00 | | |
| Boston Medical and Surgical Journal | | 9,756.50 | 10,500.00 | | 743.50 |
| Defense of Malpractice | | 685.02 | 600.00 | 85.02 | |
| Shattuck Lecture | | 200.00 | 200.00 | | |
| Cotting Lunches | | 342.33 | 400.00 | | 57.67 |
| Standing Committees: | | | | | |
| Membership and Finance | | 7.16 | 5.00 | 2.16 | |
| Ethics and Discipline | | 5.60 | 25.00 | | 19.40 |
| Medical Education and Medical Diplomas | | 138.20 | 250.00 | | 111.80 |
| State and National Legislation | | 375.12 | 720.00 | | 344.88 |
| Public Health | | 643.87 | 700.00 | | 56.13 |
| Special Committees: | | | | | |
| Industrial Insurance | | 13.70 | 50.00 | | 36.30 |
| Contingent Expenses | | 1.72 | 620.00 | | 618.28 |
| Dividends to Societies | | 2,000.00 | 2,500.00 | | 1.68 |
| Committee of Arrangements | | 498.32 | | | |
| Total Expenses as per Auditing Report | | $21,443.66 | | $946.96 | $2,103.30 |
| Total Budget | | | $22,600.00 | | |
| Expenses over-estimated | | 1,156.34 | | 1,156.34 | |
| | | $22,600.00 | $22,600.00 | $2,103.30 | $2,103.30 |
| Revenue under-estimated | | $1,407.53 | | | |
| Expenses over-estimated | | 1,156.34 | | | |
| Total Gain over Budget | | $2,563.87 | | | |

### Report of Committee on Membership and Finance, as to Finance.

The Committee on Membership and Finance submits the following Budget for the fiscal year 1921.

It calls the attention of the Council to the fact that the object of a budget is to apportion as fairly as may be, the income of the Society to the various committees which must expend it; that this income is not fixed and can be only estimated; that certain committees are yearly allowed sums which they never spend, and that other committees are occasionally forced to exceed their appropriations.

They would also call attention to the gratifying fact that the actual income of the Society last year exceeded the estimate by $1,407.53, while the expenses were again overestimated by $1,156.34, resulting in a total gain to the Society over the budget, of $2,563.87, and that the present committee will be pleased if their forecast proves as satisfactory as did that of their predecessors.

Respectfully submitted,

S. B. Woodward,

*Chairman, Committee on Membership and Finance.*

### THE BUDGET FOR 1921.

| | | | |
|---|---|---|---|
| Income as estimated by the Treasurer | | | $32,000 |
| Appropriations for expenditures: | | | |
| Salaries of officers: | | | |
| Secretary | $1,100 | | |
| Treasurer | 500 | | |
| Librarian | 400 | | |
| | | $2,000 | |
| Expenses of officers: | | | |
| President | $200 | | |
| Secretary | 800 | | |
| Treasurer | 150 | | |
| Librarian | 50 | | |
| District Treasurers | 1,500 | | |
| Censors | 500 | | |
| Supervisors | 30 | | |
| Delegates to A. M. A. | .. | | |
| | | $3,230 | |
| | | | $5,230 |
| Rent | | | 750 |
| Journal | | | 15,000 |
| Defense Malpractice Suits | | | 600 |

| | | |
|---|---|---|
| Shattuck Lecture | 200 | |
| Cotting Lunches | 400 | |
| Standing Committees | | |
| Membership and Finance | 5 | |
| Scientific Papers | 100 | |
| Ethics and Discipline | 25 | |
| Medical Education and Medical Diplomas | 225 | |
| State and National Legislation | 500 | |
| Public Health | 700 | |
| Industrial Insurance | 50 | |
| Contingent Fund | 715 | |
| | | $24,500 |
| Unappropriated Balance | | $7,500 |

# Miscellany.

## UNITED STATES CIVIL SERVICE EXAMINATIONS.

Senior Assistant Physician, $2,500 to $3,500 a Year.
Assistant Physician, $2,000 to $2,500 a Year.
Junior Assistant Physician, $1,500 to $1,800 a Year.
Receipt of Applications to Close March 22, 1921.

The United States Civil Service Commission announces open competitive examinations for the positions listed above. Vacancies in Saint Elizabeths Hospital, Washington, D. C., at the salaries indicated, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

*Range in salary.*—The entrance salary within the range stated for each position will depend upon the qualifications of the appointee as shown in the examination.

*Maintenance.*—Maintenance is also provided to appointees, or in lieu of maintenance, an allowance which is determined by the amount of basic salary, either of which will be allowed in the discretion of the appointing officer.

*Bonus.*—Appointees at annual compensation of $2,500 or less, whose services are satisfactory, may be allowed the increase granted by Congress of $20 a month.

*Citizenship and sex.*—All citizens of the United States who meet the requirements, both men and women, may enter these examinarions; appointing officers, however, have the legal right to specify the sex desired in requesting certification of eligibles.

*Subjects and weights.*—Competitors will not be required to report for examination at any place, but will be rated on the following subjects, which will have the relative weights indicated: (1) Education, 25; (2) Experience, 50; (3) Thesis, reorts, or publications (to be filed with application), 25; Total, 100.

*Basis of ratings.*—Under the first two subjects the ratings will be based upon competitors' sworn statements in their applications and upon corroborative evidence.

*Education.*—For each of these positions applicants must have graduated from a recognized medical school.

*Experience.*—Under the second subject applicants for the position of senior assistant physician must have had at least five years' experience in an institution for the care of the insane or in genuine specializing work with the insane or allied classes; applicants for the position of assistant physician must have had at least three years of such experience; and applicants for the position of junior assistant physician must have had at least one year of such experience.

*Writings.*—Under the third subject applicants must submit with their applications, publications, or reports of which they are the author or co-author, or in lieu thereof, a thesis of at least 2,000 and not more than 5,000 words on some phases of insanity or allied conditions (feeble-mindedness, epilepsy, constitutional defectives, etc.)

The writing submitted must be such as may be retained on file with the application during the period of eligibility.

*Age.*—Applicants must not have reached their seventieth birthday on the date of examination. In view of the retirement act, should the appointing officer so requests, certification will not be made of eligibles who have reached their fifty-fifth birthday.

*Retirement.*—Classified employees who have reached the retirement age and have served fifteen years are entitled to retirement with an annuity. The retirement age for railway mail clerks is 62 years, for mechanics and post-office clerks and carriers 65 years, and for others 70 years. A deduction of 2½ per cent. is made from the monthly salary to provide for this annuity, which will be returned to persons leaving the service before retirement with 4 per cent. interest compounded annually.

Applications should be properly executed, excluding the county officer's certificate, but *including the medical certificate*, and must be filed with the Civil Service Commission, Washington, D. C., with the material required, prior to the hour of closing business on March 22, 1921.

## SOCIETY NOTICES.

Harvard Medical Society.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, March 1, at 8.15 o'clock.

Program.

Kidney Function. By Dr. A. N. Richards, Professor of Pharmacology, University of Pennsylvania.

Medical students and physicians are cordially invited to attend.

Cyrus C. Sturgis, *Secretary.*

Massachusetts General Hospital.—Staff Clinical Meeting, Lower Out-Patient Amphitheatre, Monday, February 28, 1921, 8 p.m.

Program.

1. The Pernicious Anemia of Pregnancy.
   Dr. George R. Minot.
2. Hemocidal Properties of the Blood.
   Dr. Thomas E. Buckman.
3. Some Aspects of Bile Pigment Metabolism.
   Dr. Chester M. Jones.
4. Isoagglutinins and Hemolysins in Infants.
   Dr. Basil Jones.

Doctors, nurses and medical students are invited.

F. A. Washburn, M.D., *Resident Physician.*

## RECENT DEATH.

Dr. Eudora Meade Faxon died at the home of her daughter, Dr. Dora W. Faxon, Arlington Heights, February 10, 1921, aged 78.

She was born in Waterville, Me., August 30, 1842, the daughter of Alonzo Draper, a Boston musician, and Hannah Vose Crane Draper. The family lived in South Boston, where Eudora was educated. In 1892 she was graduated from the College of Physicians and Surgeons of Boston, and in 1894, from the Tufts College Medical School. She joined the Massachusetts Medical Society in 1892 and was retired in 1912, practising in Boston and Franklin. Formerly she was active in the affairs of the Ladies Physiological Society. She married Henry Faxon, Jr., in 1865. He died in 1893.

The Boston Medical and Surgical Journal

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# Original Articles.

## THE ENERGY REQUIREMENTS OF GIRLS FROM 12 TO 17 YEARS OF AGE.

By Francis G. Benedict and Mary F. Hendry, Boston.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

The Nutrition Laboratory has had for one of its major problems the determination of the basal metabolism of humans from birth to old age. The earliest[1] of its contributions to this problem was the accumulation of a considerable number of metabolism measurements on young people of both sexes at about the college age, as at this age subjects were readily available for observations. Basal values were also usually found in connection with other inquiries, although not infrequently effort was made to obtain basal values *per se.* To secure observations at ages other than the college age required definite, special experiments. The determination of the metabolism of new-born infants necessitated our intimate association with the Boston Lying-In Hospital, where this problem was studied with approximately one hundred infants of both sexes. The years of early childhood from birth to two years of age were studied with a large number of infants at the Massachusetts Wet-Nurse Directory, and from two to twelve years of age at the New England Home for Little Wanderers. The gap between 12 years and the college age, 18 or 19 years, was noticeable when an attempt was made to plot any curves for the general trend of metabolism of males and females.

Since the earlier literature contains but very little of basal value in the study of the metabolism of children of this age range, and particularly since the metabolism of girls has been considered experimentally very much less than that of boys, it seemed desirable, if possible, to begin our observations with girls. A second incentive for studying girls was the lack of connection between the curve indicating the trend of metabolism of girls from birth to 12 years of age and the general slope of the line indicating that of women. Based on the individual measurements of boys and girls made by Benedict and Talbot,[2] curves were drawn showing the most probable trend of metabolism when compared with age and weight, on the several bases commonly used for comparative purposes. With girls, as well as with boys, reasonable uniformity and regularity was shown from birth to 12 years of age, but from the abnormal trend of the line for girls after this age it was especially emphasized that the number of girls measured over 12 years of age and below 17 years was altogether too small to warrant any general deductions, and it was this part of the curve that up to the present time remained practically uncharted.

With boys it has been found that the most probable basal metabolism of a boy from one to thirteen years can be estimated with a considerable degree of accuracy from the biometric formula of Harris,[3] derived from the analysis of the metabolism of a large number of men. Indeed there is every probability that the prediction by this formula likewise holds true for boys from 13 years to 19 or 20 years of age. The consistent irregularity in predicting the heat of women from the Harris-Benedict formula for women makes all estimates using this formula of very much less value than those using the formula for male adults, and since the prediction of the heat for young girls from 2 to 12 years of age from the formula for women gives results entirely discordant with the facts, one cannot infer that with a higher age range from 12 to 20 years the formula for women will necessarily predict the most probable basal heat. Moreover, a clear sexual differentiation was shown by the comparison of the metabolism of boys and girls from birth to 12 years of age,[4] and the peculiar sweep of the curve from 8 to 12 years in the case of girls emphasized the importance of studying more particularly girls from 12 to 17 years of age.

### PREVIOUS INVESTIGATIONS.

In examining the literature for observations on the metabolism of girls and confining ourselves to those with girls between 12 and 17 years of age, inclusive, we find the earliest studies are those of Andral and Gavarret.[5] These investigators, although overlooking the importance of recording weight and height and making their observations under conditions not basal, report a carbon excretion corresponding to a 24-hour heat production in the case of a girl 13 years of age amounting to 1663 calories, with a girl 15½ years old, 1879 calories, and with another girl, also 15½ years old, 1663 calories. The first two girls had not as yet reached puberty.

The most extended observations on girls were those of Magnus-Levy and Falk,[6] who studied six girls in the age range here under consideration, weighing from 24 to 54 kilograms. With characteristic accuracy they carefully recorded the weights and heights, as well as the data for the metabolism experiments. Hence it is possible, by applying a more recent formula,[7] to compute accurately the body surface area, which still has a fascination for many physiologists as a means of comparing the basal metabolism of different individuals. In Table I herewith are given the metabolism measurements of these girls, together with the ages, heights and weights.

Table I.—Basal Metabolism of Girls (Magnus-Levy and Falk).

| Age | Body weight (without clothing) | Height | Pulse rate | Heat (computed) per 24 hours | |
|---|---|---|---|---|---|
| | | | | Per kg. | Per sq. m.[1] |
| yrs. | kgs. | cms. | | cals. | cals. |
| 12[2] | 24.0 | 129 | 76 | 40.1 | 1023 |
| 12[2] | 25.2 | 128 | — | 37.2 | 987 |
| 12[3] | 40.2 | 145 ? | 84 | 33.9 | 1072 |
| 13 | 31.0 | 138 | — | 39.3 | 1106 |
| 14[4] | 35.5 | 143 | 96 | 36.6 | 1092 |
| 17[5] | 54.0 | 156 | — | 26.0 | 923 |

[1] Computed by us, using body surface areas found from the Du Bois height-weight chart. [2] Somewhat backward in growth. [3] Advanced in development; puberty beginning. [4] Just prior to puberty being established. [5] Puberty established.

### EARLIER NUTRITION LABORATORY DATA.

The Nutrition Laboratory has thus far published basal metabolism observations on eight girls ranging in age from 12 to 16 years. Observations on four of these, representing ages 15 and 16 years, respectively, were carried out by Mr. Louis E. Emmes, formerly of the Nutrition Laboratory staff; the observations on the remaining four have been recently published by Benedict and Talbot. The data for these eight girls are given in Table II herewith.

### FACTORS AFFECTING THE METABOLISM OF ADULTS AND CHILDREN.

From the preliminary, comparative measurements of Emmes, Roth, and Smith,[1] substantiated by the careful biometric analysis of Harris,[8] it is clear that the basal metabolism of adults is affected independently by at least four factors, sex, weight, height, and age. Of these the influence of weight has long been recog-

Table II.—Basal Metabolism of Girls Previously Studied by the Nutrition Laboratory.

| Subject number | Age | | Body weight (without clothing) | Height | Pulse rate | Heat (computed) per 24 hours | |
|---|---|---|---|---|---|---|---|
| | | | | | | Per kg. | Per sq. m. |
| | yrs. | mos. | kgs. | cms. | | cals. | cals. |
| 248[1] | 11 | 11 | 28.8 | 129 | 75 | 36.9 | 1026[2] |
| 239[1] | 12 | 1[3] | 39.2 | 148 | 72 | 38.3 | 1179[2] |
| 251[1] | 12 | 2[4] | 30.9 | 139 | 78 | 32.8 | 920[2] |
| 257[1] | 13 | 4 | 37.1 | 140 | 74 | 35.5 | 1079[2] |
| 23[5] | 15 | 4 | 56.8 | 157 | 65 | 28.7 | 1038[6] |
| 36[5] | 15 | 6 | 52.1 | 162 | 70 | 26.0 | 879[6] |
| 39[5] | 15 | 8 | 51.4 | 158 | 77 | 30.0 | 1021[6] |
| 42[5] | 16 | 5 | 50.6 | 162 | 83 | 25.2 | 838[6] |

[1] See Benedict and Talbot, Carnegie Inst. Wash. Pub. No. 302 1921, p. 123. Subject numbers underlined represent girls who have *not* reached puberty. [2] Computed from body surface areas measured by the Du Bois linear formula. [3] Puberty established. [4] Puberty beginning. [5] See Benedict, Emmes, Roth, and Smith, Jour. Biol. Chem., 1914, Vol. xviii, p. 139. Puberty probably established; no record. [6] Computed from body surface areas obtained from the Du Bois height-weight chart.

nized. The effect of height *per se* is more obscure, since tall people are usually heavier and weight changes would mask any changes due to height alone, and it is only through careful biometric analysis that the height factor can be definitely shown. The influence of age, likewise, is clearly proven, as well as that of sex. With adults the relation between metabolism and each of these factors can be, for the most part, represented by a straight line, although very wide variations occur in all instances. Thus, there is a distinct increase in metabolism with increasing weight and height, and there is a distinct, though slight, decrease with increasing age. With new-born infants on the first day of birth, Benedict and Talbot[9] showed clearly that very low values were found for the metabolism, either per unit of body weight or per unit of surface, until about the age of one creases from there on, per unit of weight and per unit of surface, until about the age of one year, or at a body weight of 10 kilograms, where it begins to fall. From the analysis of the metabolism of adults, made by Harris and Benedict,[8] no peculiar abnormalities were noted at any given age, weight or height, but with children a specifically high metabolism was noted at about the age of one year or the weight of 10 kilograms.

During the later period of growth, from 12 to 17 years, one factor enters into the development of life which produces pronounced psychological as well as physiological alterations in the body, namely, the influence of puberty. That so pronounced a factor should be reflected somewhat in the basal metabolism was seriously considered as early as the days of Andral and Gavarret,[5] who drew rather extensive conclusions from their data, conclusions that unfortunately, owing to the deficiency with which their data are reported, cannot at the present day be verified. Magnus-Levy and Falk,[6] however, recorded most carefully the pubertal changes in the subjects that they studied.

Perhaps the most pronounced effect of approaching puberty upon metabolism is that reported for boys by DuBois, who found a very high specific metabolism with boys at the age of 12 and 13 years, while with the same boys two years later, after puberty was thoroughly established, he found the metabolism was considerably lower.[10] From the fact that there is a high metabolism at 10 kilograms or one year of age, falling off thereafter, one would normally expect that boys, and indeed girls, at 12 years of age would have a slightly higher metabolism than boys and girls two years later. The extraordinarily high values found by DuBois, however, were interpreted by him as being a specific effect of the approaching pubertal changes. It is quite clear, therefore, that serious consideration of the influence of puberty upon the metabolism of young children is a necessary accompaniment of any extended study of the vital activities of youth.

The age factor in basal metabolism is fairly small with adults, that is, the decrease in calories per 24 hours for each year with the average adult is 7.15 for men and 2.29 for women.[11] With young children the influence of age has been shown to be very pronounced, and one can predict that from two years of age on, the metabolism per unit of weight will gradually decrease until it approaches the value for adults. Thus, the influence of age *per se* is of special interest in studying the metabolism of children. But the influence of the various stages of the establishment of puberty must naturally receive special consideration. The study of the metabolism of children, therefore, between 12 and 17 years of age, is of prime interest in throwing light upon, first, the influence of the establishment of puberty and, second, the influence of age upon metabolism. In our investigation, therefore, both of these factors were taken into serious consideration and the experimental routine purposely planned to study, if possible, the influence of these two factors upon human metabolism.

### METHOD OF STUDY.

With the accumulation of data at ages from birth to 12 years and at the college age, it was seen that to complete the picture of basal metabolism from 12 to 17 years with both boys and girls by the earlier method of experimentation, *i.e.*, by studying the individual, would require considerable time. Since the post-absorptive condition and complete muscular repose are prerequisites for the best modern basal metabolism measurements, it is desirable that the subject be without food for 12 hours, that he should come to the laboratory in the morning without breakfast, and remain lying quietly for some time prior to the actual tests. By any of the standard methods the subsequent gaseous metabolism measurements would involve from one and one-half to two hours or more time on the part of the subject and operators.

Furthermore, a study of the basal metabolism of humans[8] has shown that the variation is large, that individual determinations are of prime value in giving a general picture as to the most probable metabolism of individuals of a given sex, age, weight, and height, and that this probable metabolism cannot adequately be computed until a relatively large number of observations have been made on individuals. Fortunately in recent years a method of studying individuals in groups has been satisfactorily developed in this Laboratory and put to severe tests, and we were therefore in a position to consider studying not only individuals but groups of individuals. This made it possible to attack the whole problem from a different angle.

Entirely aside, however, from the labor involved in individual measurements of children of this age range, came the problem of securing the subjects. In studying girls in the age range of 12 to 17 years we found that institutional children were practically precluded as subjects. Furthermore, we found that the coöperation of the subject and usually of the parents was essential. Most parents will not readily subject their children to the supposed hardship of leaving home early in the morning, without breakfast, to go some distance to a laboratory for purposes of observation. DuBois,[10] in studying his Boy Scouts, had to resort to giving a "small" breakfast, but even under these conditions the boys were studied alone in a respiration chamber, rarely slept, were usually awake, were allowed to read, in many instances were very much bored, and apparently at times restlessness was controlled with difficulty. We foresaw instantly that such an experience would be our lot, did we attempt to study individual girls, with perhaps great difficulty in securing the coöperation of the parents as well as the children for such an observational routine.

A method which will allow the subject to be with a group of individuals and which does not call for any great hardship in the line of deprivation of meals or isolation in strange apparatus, would normally appeal more readily to a group of girls than the regular metabolism technique. In the last analysis individual determinations of basal metabolism are of prime interest in establishing the probable normal or the variations from normal, which may commonly be expected. These variations we have already seen to be rather considerable. No two individuals of the same height, weight, age and sex may be stated to have exactly the same metabolism, and if a group of girls of a given age were studied individually, metabolism measurements of rather considerable variability could normally be expected. Even provided the girls were all selected of the same weight as well as the same age, variations would still exist, and if, as a result of most stringent selection, uniform height were added to these two constant factors, we have reason to believe that even this selection would not rule out a considerable number of individual variations. Consequently the averaging or grouping of results is ultimately necessary in forming a general picture as to the trend of metabolism, based upon either age, height or weight. It is, therefore, not illogical to study a group of individuals in which one factor is approximately constant, such as age, for example, in an apparatus which does not distinguish one individual from another, that is, in an apparatus where the measurements are made *en masse* or by a group system. It is our belief that with children such a method of study would be even more logical and permissible than with adults. It would not be possible, for example, or justifiable to measure the simultaneous metabolism of 12 adults in which the age factor alone was held constant. Thus, with 12 women of 40 years of age, experience has shown that the weight factor may vary greatly. On the other hand, children "run to form" more regularly than adults, for there are seldom excessively fat children, although the excessively thin child is only too frequent. Indeed, so reasonably regular is the relationship between age and weight that it is common to establish a weight-age curve for children. At present this curve is much used in the attempts to secure better nourished children in schools, although destined, we believe, soon to be superseded by the scientifically more exact weight-height curve.

The study of humans in groups has been satisfactorily carried out and the efficiency of the method thoroughly demonstrated in this Laboratory in at least two researches. In an investigation of several months' duration on the influence of prolonged undernutrition upon basal metabolism[12] two separate groups of students from the International Y. M. C. A. College, Springfield, Mass., were studied while in bed, asleep, in a large respiration chamber at the Nutrition Laboratory. Both groups represented fairly homogeneous material, *i.e.*, the college undergraduate body. The basal metabolism, computed per kilogram of body weight, of these two groups studied *en masse* was identical on successive nights, prior to any dietetic alterations, thus demonstrating that the apparatus gave very uniform results and that a group of 12 selected from fairly homogeneous material was sufficiently large. Even larger groups were studied in this chamber, engaged in light household operations.[13] For instance, as many as 25 young women students at Simmons College, Boston, were studied simultaneously, average values for the several household occupations being secured with rapidity and uniformity from period to period.

To apply this method of studying metabolism in groups to young girls involved no special alteration. Emphasis was laid upon the group or troop idea, and with this in mind our first efforts to secure subjects were made through that highly organized and most successful institution, the Girl Scouts of America, a part of whose creed is the idea of service to humanity in some definite form. By selecting, therefore, groups from the Girl Scouts, many difficulties in the way of administrative responsibility and individual apprehension on the part of both the girls and their parents could be avoided.

The respiration chamber in which the studies on undernutrition and household activities were made determines only carbon dioxide, and the question immediately arose as to whether this determination alone can serve as an index for basal metabolism with a sufficient degree of accuracy to justify the expenditure of time and labor necessary for so extended a series of observations as was originally planned. The oxygen consumption is, on the whole, a much better index of the heat production than is the carbon-dioxide output, but if it is possible to compute (with a fair degree of accuracy) or, better still, determine, as we ultimately did, the respiratory quotient of the group as a whole, the total carbon-dioxide measurement is no longer inferior to the oxygen measurement as an index of the total heat production.

In brief, then, our method was to study groups of girls of constant age, selected from various troops of Girl Scouts. Each group received a light, uniform supper at the Laboratory and engaged in no excessive muscular activity during the evening. The girls slept inside a respiration chamber throughout the night and measurements of the carbon-dioxide production were made while they were in deep sleep. Thus complete muscular repose and control of the factor of food ingestion were insured, and hence the computation of the probable heat production from the carbon-dioxide output could be made with a reasonably small error. If the experimental periods are sufficiently short to enable a repetition of measurements from half hour to half hour or from hour to hour, the minimum values thus found should correspond to the true basal carbon-dioxide production. If the values are affected by muscular activity, certain periods will be much higher than others. If they are affected by differences in the character of the material katabolized, one would normally expect high values for carbon dioxide at the beginning of the night, these values rapidly decreasing and not subsequently increasing throughout the night.

### TECHNIQUE.

The respiration chamber in which these observations were carried out has been described in considerable detail in an earlier publication.[12] Its main features* are an air-tight room or chamber, lined with sheet-metal, two windows at one end for light supplemented by electric illumination, a hinged trap door at the top relying for final closure upon a water seal, a pipe supplying uncontaminated outdoor air at one end of the chamber, and a pipe delivering air from the chamber to the aliquoting device. To assist in maintaining comfortable conditions, a brine coil pipe, which could be supplemented by an electric fan blowing over it, made temperature control most satisfactory. The air leaving the chamber contained carbon dioxide produced by the children. This was withdrawn by an electric blower, properly aliquoted, and the carbon dioxide in the aliquot sample was completely removed by driving the sample through bottles containing soda-lime and sulphuric acid, respectively. Duplicate analyses could be satisfactorily made. The accuracy of the apparatus as a whole for determining carbon dioxide has been repeatedly tested by introducing into the chamber accurately weighed amounts of carbon dioxide from a steel cylinder containing the liquefied gas. The subsequent recovery of this gas by means of the aliquoting and carbon-dioxide absorbing device is sufficiently perfect to stamp the apparatus as an instrument of precision.

The air of the room was cool, dry, and kept in motion by an electric fan. The ventilation was only of such a rate as to keep the carbon-dioxide percentage inside the chamber not far from 0.5. While not infrequently subjects complained of the fact that the chamber seemed warm, no complaint of odor, stuffiness or any other disagreeable feature was ever made. It should be stated that many of these children had been trained to sleep on outside sleeping porches, even in winter. It was mechanically impossible to lower the temperature of the respiration chamber to any degree corresponding to this. Usually the temperature of the dry bulb was not far from 18° to 20° C., while that of the wet bulb varied from 10° to 11° C.

The carbon-dioxide production of each group of girls was measured for every half hour or hour period throughout the night.* The respiratory quotient was determined in the following manner: after the minimum carbon-dioxide production per half hour or per hour had been clearly established, which occurred usually not far from 12.30 to 1.30 A.M., *i.e.*, after all the girls were sound asleep, a few periods were then made to insure that the carbon-dioxide production did not decrease further and that the minimum had been reached. On several nights the entire ventilation was stopped from 3.30 A.M. to 4.30 A.M., or 5 A.M., during which time the carbon-dioxide percentage in the air of the chamber, which was normally not far from 0.5 at this hour in the morning, rose to between 0.8 and 0.9. By making a most careful determination with the Sondén apparatus[14] of the carbon-dioxide percentage in the air, as well as of the oxygen percentage, the respiratory quotient could be determined. This method is identically that which was employed in the investigation on under-nutrition[15] in determining the respiratory quotients of subjects inside a treadmill chamber.

As a result of our several determinations of the respiratory quotient we have made all our computations for the heat production of these girls by assuming a calorific value of carbon dioxide amounting to 3.086 calories per gram.

*(To be continued.)*

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# CLINICAL OBSERVATION WITH BENEDICT'S NEW PORTABLE RESPIRATION APPARATUS.

By Paul Roth, M.D., Battle Creek, Mich.,

*Metabolism Department of the Battle Creek Sanitarium.*

The rapidly spreading interest shown by clinicians in the estimation of the basal metabolic rate as a diagnostic and therapeutic guide in medicine and surgery is primarily the result of many years of patient and painstaking research. Studies have been made with most elaborate and intricate, as well as costly apparatus of various kinds for the sole and fundamental purpose of establishing the normal standards, without which even the most accurate determination of the metabolic rate would be useless to the clinician. Without those and other physiological standards, there can be no meaning in mere figures relative to the quantitative or qualitative measurements of any body function.

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* This principle has been applied to the study of the carbon-dioxide production of large domestic animals in the Agricultural Experiment Station, Durham, N. H. See Benedict, Collins, Hendry, and Johnson: "A Respiration Chamber for Large Domestic Animals," Technical Bulletin No. 16, 1920, New Hampshire Agricultural Experiment Station.

* It is a great pleasure to acknowledge the faithful and invaluable assistance in these tedious night observations of Miss Marion L. Baker, without whose skillful aid the research could hardly have been completed.

If the measurement of the rate of function of individual organs or systems is indispensable in clinical work, one would most naturally expect that the measure of the sum-total of body energy output, in other words, the measure of the metabolic rate, should prove to be of inestimable value.

There are today a large number of functional measurements which, in spite of their importance, have never entered the field of clinical practice because many such measurements are simply impossible outside the research laboratory. While we admire the great ingenuity that has been exhibited in contriving devices of the most intricate nature to meet the demands of the complex problems which had to be faced to establish reliable normal metabolic rate standards, the efforts made to simplify ways and means, thus placing within the reach of the clinician an invaluable diagnostic and therapeutic guide, deserve our respectful recognition.

We are deeply indebted to Dr. F. G. Benedict, director of the Nutrition Laboratory of the Carnegie Institution, who, through his personal help and the coöperation of members of his staff enabled the writer to establish, in 1913, at the Battle Creek Institution, the first laboratory for the clinical study of basal metabolism.

At that time the activities of this department were largely confined to the management of diabetes, hyperthyroidism and obesity. In its early days the laboratory also collaborated in the study of "The Basal Metabolism of Normal Men and Women."[1]

The apparatus used was the "Benedict Universal Respiration Apparatus,"[2] devised over ten years ago. Until that time the determination of body metabolism required, even in the simpler methods, an analysis of the expired air. This was a serious obstacle to the introduction of the methods in clinical work, because of this comparatively difficult step which at best requires a well-trained analyst. It was to eliminate entirely the need of air analysis that Benedict devised his first respiration apparatus.

This proved successful and encouraged the inventor to further attempts to devise an apparatus which would be simple in operation and easily transported to the bedside. This "transportable" respiration apparatus is fully described and discussed in the literature referred to below.[3]

Seven of these were first built at the Nutrition Laboratory of the Carnegie Institution, and were part of an elaborate outfit gathered at this laboratory and sent out with a corps of workers to the Y. M. C. A. College at Springfield, Massachusetts, in the fall of 1917, where they were in daily use for over four months in the study of "Human Vitality and Efficiency under Prolonged Restricted Diet."[4]

Having taken an active part in this research both in Boston and Springfield, Massachusetts, under the direction of Dr. Benedict, I not only became thoroughly acquainted with the use of this apparatus but obtained a thorough personal experience in the technic involved in the "Respiratory Valve Method," the so-called "Tissot" method, with which also daily observations were made.

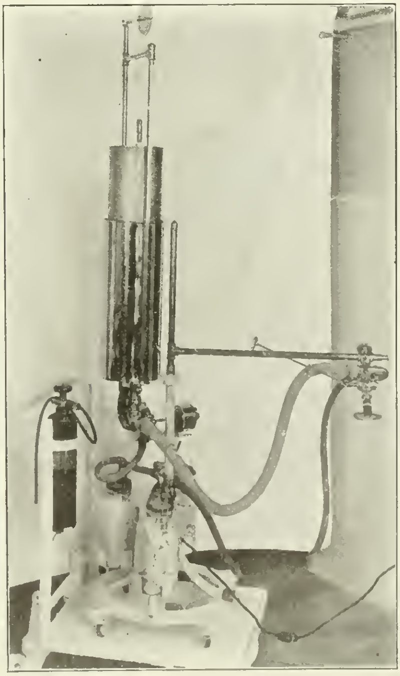

Fig. 1.

Upon the completion of this work one of the Benedict apparatus was purchased and added to our equipment at the Battle Creek Sanitarium. Later the rapidly growing needs required the addition of three more apparatus of the same type.* One of them was placed on a small truck to make it easily transportable (Fig. 1).

Realizing the specific advantages of a more elaborate equipment which would enable us to resume various lines of research work interrupted by the war, and also in order to study more specifically those cases in which the determination of the respiratory quotient is important, we introduced, at a considerable expense the "Tissot" method[5] with a battery of Haldane Air Analysis Apparatus and two gasometers.[6]

This phase of the work was placed under the supervision of Miss Anna C. Peterson, M.S., a skillful technician, under whose direction additional air analysts were trained.

I have had an unusual opportunity to compare from all standpoints the clinical merits of the methods and apparatus mentioned. On account of its simplicity, greater ease of operation and the remarkably satisfactory results, I consider Benedict's respiration apparatus one of the most valuable contributions of recent years to the armamentarium of the clinician.

This is merely touching the salient points in my personal observations relative to this most important subject. Those interested will, no doubt, appreciate further valuable modifications which have recently been made by Benedict in his apparatus.[7] It is now not only truly "portable" but also the chances of leakage have been almost entirely eliminated and its up-keep much simplified, all of which has been attained without any sacrifice of accuracy.

The clinician must often, of necessity, apply methods and use apparatus of all kinds merely on their reputation. Benedict is recognized as the highest authority on methods, apparatus, and technic in the study of metabolism. He emphatically states that "the portable will always be an *empirical* apparatus," and "distinctly a *clinical* apparatus." He and others have, nevertheless, demonstrated in its use, a degree of accuracy which, in the work for which it is intended, is equal to that obtained with other more intricate methods and apparatus. A satisfactory technic for its use can be mastered in one hour's time by an intelligent high-school graduate, or the equivalent. At my request a young woman who had just joined the laboratory force and who had never before seen the apparatus, was given less than a half hour's instruction in the technic of the use of the apparatus, following which she made a successful determination, using her instructor as a subject.

I do not wish to give the impression that further careful technical training is not essential, but I maintain that the ability required to make with it a successful estimation of the metabolic rate, is well within the reach of an individual who has any right to the position of doctor's or laboratory assistant. In weighing the chances of error, for they will occur in spite of the most careful technic, I am convinced that they lie much more in the improper management of the subject examined than in the handling of the apparatus. Tact, irrespective of the method used, and good judgment, are of the utmost importance with sick individuals. In rare cases success is an impossibility because the necessary coöperation of the patient cannot be obtained. Not infrequently a second test a day or two later will prove very successful when the first failed. A tactful and observing technician usually succeeds from the start where an indifferent, machine-like, though otherwise perfect operator fails, and failures of this sort should not be attributed to the method. The test is for the determination of the *basal* metabolic rate and not the metabolic rate as influenced by apprehension, fear, fatigue, impatience, indignation (the result, perhaps, of long waiting one's turn in the physician's office), the tickling of a fly, discomfort, pain, or anything which increases muscular tension.

I had the opportunity to use and thoroughly test an apparatus of this new type, constructed under the direction of Dr. Benedict by Mr. W. E. Collins, mechanician of the Nutrition Laboratory.* The apparatus was unpacked and set up by a university student who had had no experience in our metabolism department. Miss S. L. Cole of the department made most of the 48 observations reported in Table I.

While the apparatus was not entirely entrusted to inexperienced hands, it received from our laboratory staff only the intelligent man-

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* From the Sanborn Company, Boston, Mass.

* I am informed that the apparatus is now obtainable from Warren E. Collins, 584 Huntington Ave., Boston 17, Mass.

TABLE I.—BASAL METABOLISM, DETERMINED WITH BENEDICT'S NEW PORTABLE RESPIRATION APPARATUS.

SERIES OF FORTY-EIGHT OBSERVATIONS ON UNSELECTED, CONSECUTIVE CLINICAL CASES.

| No | Sex Age | Weight kg | Height cm | Period | Time (Min) | Pulse | Pulse Avge | Resp. | Resp. Avge | $O_2$ per min. cc | $O_2$ Avge | Basal Metab Rate | Basal Metab Avge | Observations Of Operator | DIAGNOSIS Clinical Findings Suggesting Faulty Metabolism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F 26 | 65.4 | 165 | A<br>B | 13.63<br>10.35 | 90<br>91<br>91 | 91 | 22<br>20<br>20 | 21 | 215<br>214 | 215 | -4<br>-4 | -4 | None | AUTO-INTOXICATION<br>Nervous Exhaustion. |
| 2 | F 48 | 42.7 | 164 | A<br>B | 5.98<br>3.92 | 88<br>88 | 88 | 17<br>17 | 17 | 209<br>220 | 215 | +17<br>+24 | +21 | Became excited<br>Period cutshort | CHRONIC FOLLICULAR TONSILLITIS, ALVEOLAR ABSCESS<br>Neurasthenia with Apprehension |
| 3 | F 53 | 53.2 | 170.5 | A<br>B | 13.07<br>10.12 | 101<br>97<br>99 | 99 | 16<br>15 | 16 | 225<br>221 | 223 | +15<br>+14 | +16 | Very nervous | CHRONIC FOLLICULAR TONSILLITIS, SECONDARY ANEMIA, CARDIAC HYPERTROPHY (SLIGHT) |
| 4 | M 46 | 44.4 | 165½ | A<br>B | 16.20<br>6.22 | 58<br>58<br>57 | 58 | 15<br>15 | 15 | 194<br>191 | 193 | +0<br>-2 | -1 | Mr. B. Very difficult case to handle in every respect.<br>* | HYPOTHYROIDISM:<br>Asthenia, Symptoms of Hysteria. |
| 5 | M 46 | 44.2 | 165½ | A<br>B | 13.22<br>10.70 | 54<br>59<br>47 | 50 | 23<br>19 | 21 | 193<br>191 | 192 | -1<br>-2 | -1 | | |
| 6 | M 46 | 43.2 | 165½ | A<br>B | 13.12<br>10.66 | 54<br>55<br>55 | 55 | 24<br>26<br>26 | 26 | 224<br>227 | 226 | +17<br>+16 | +15 | | |
| 7 | M 45 | 42.05 | 165½ | A<br>B | 12.37<br>9.60 | 56<br>58<br>59 | 58 | 19<br>19<br>20 | 19 | 187<br>167 | 187 | -2<br>-2 | -2 | | |
| 8 | M 46 | 42.5 | 165½ | A<br>B | 11.35<br>9.38 | 60<br>60 | 60 | 21<br>20 | 21 | 166<br>165 | 167 | -17<br>-18 | -18 | | |
| 9 | M 45 | 43.0 | 165½ | A<br>B | 12.42<br>9.68 | 55<br>58 | 57 | 18<br>20 | 19 | 189<br>185 | 187 | -1<br>-4 | -2 | | |
| 10 | F 64 | 62.6 | 163 | A<br>B | 13.27<br>10.43 | 53<br>52<br>51 | 52 | 12<br>14<br>16 | 14 | 170<br>171 | 171 | -16<br>-15 | -16 | None | CHRONIC MYOCARDITIS WITH MITRAL INSUFFICIENCY; Insomnia, Neurotic Temperament. |

| No | Sex Age | Weight kg. | Height cm | Period | Time (Min) | Pulse | Pulse Avge | Resp. | Resp. Avge | $O_2$ per min. cc | $O_2$ Avge | Basal Metab. Rate | Basal Metab. Avge | Observations Of Operator | DIAGNOSIS Clinical Findings Suggesting Faulty Metabolism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | F 45 | 56.4 | 164½ | A<br>B | 12.90<br>10.03 | 73<br>73<br>72 | 73 | 18<br>17 | 17 | 154<br>156 | 155 | -20<br>-19 | -19 | None | LUES, CONSTIPATION;<br>Nervousness, Insomnia. |
| 12 | F 64 | 63.2 | 169½ | A<br>B | 13.32<br>10.60 | 81<br>83<br>82 | 82 | 21<br>18<br>15 | 19 | 213<br>220 | 217 | +10<br>+13 | +12 | None | ANGIO-NEUROTIC EDEMA, MIGRAINE |
| 13 | M 14 | 48.2 | 156.5 | A<br>B | 9.43<br>6.75 | 76<br>75 | 76 | 18<br>19 | 17 | 253<br>251 | 252 | +10<br>+9 | +9 | None | TESTICULAR HORMONE INSUFFICIENCY |
| 14 | M 64 | 59.5 | 172 | A<br>B | 13.17<br>10.33 | 58<br>54<br>61 | 58 | 17<br>18 | 16 | 240<br>226 | 233 | +9<br>+3 | +6 | Very Nervous | PSORIASIS, CHRONIC OSTEOARTHRITIS, CHRONIC TONSILLITIS, ALVEOLAR ABSCESS. |
| 15 | F 44 | 44.6 | 163.6 | A<br>B | 13.15<br>10.67 | 90<br>82<br>82 | 85 | 15<br>15<br>15 | 15 | 200<br>192 | 196 | +11<br>+7 | +9 | None | Enlarged Thyroid. |
| 16 | M 58 | 75.9 | 187½ | A<br>B | 9.17<br>6.42 | 68<br>67<br>69 | 68 | 14<br>14 | 14 | 341<br>324 | 333 | +31<br>+25 | +28 | None | DIABETES MELLITUS, HYPERTHYROIDISM, CARDIAC HYPERTROPHY. |
| 17 | M 45 | 60.5 | 175½ | A<br>B | 11.82<br>9.13 | 64<br>63 | 64 | 15<br>16 | 16 | 268<br>271 | 270 | +19<br>+20 | +19 | Restless<br>Moved | TERTIARY LUES, CHRONIC ALCOHOLISM, CHRONIC CARDIAC VALVULAR DISEASE-MITRAL INSUFFICIENCY, CHRONIC POISONING BY NICOTINE. |
| 18 | M 38 | 65.3 | 169 | A<br>B | 11.98<br>9.37 | 70<br>69<br>68 | 69 | 20<br>20 | 20 | 264<br>259 | 258 | +6<br>+8 | +7 | None | DIABETES MELLITUS. |
| 19 | F 16 | 42.7 | 146½ | A<br>B | 10.38<br>7.97 | 118<br>116<br>115 | 11 | 24<br>23<br>30 | 26 | 262<br>266 | 263 | +44<br>+46 | +45 | None | EXOPHTHALMIC GOITRE. |
| | | | | | | | | | | | | | | | ARTERIOSCLEROSIS, CHRONIC FOLLICULAR TONSILLITIS. |

| No | Sex Age | Weight kg | Height cm | Period | Time (Min) | Pulse | Pulse Avge | Resp. | Resp. Avge | $O_2$ per min. cc | $O_2$ Avge | Basal Metab. Rate | Basal Metab. Avge | Observations Of Operator | DIAGNOSIS Clinical Findings Suggesting Faulty Metabolism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | F 52 | 56.2 | 160 | A<br>B | 13.17<br>9.95 | 72<br>68<br>72 | 71 | 22<br>19 | 21 | 197<br>195 | 196 | +2<br>+3 | +2 | None | ARTERIOSCLEROSIS, CHRONIC FOLLICULAR TONSILLITIS. |
| 21 | M 30 | 54.6 | 170.5 | A<br>B | 11.95<br>10.00 | 61<br>61<br>60 | 61 | 12<br>12<br>13 | 12 | 213<br>214 | 213 | -4<br>-4 | -4 | None | Neurasthenia. |
| 22 | M 37 | 56.6 | 171.5 | A<br>B | 12.67<br>9.93 | 72<br>81<br>73 | 72 | 16<br>14 | 15 | 213<br>206 | 210 | -8<br>-9 | -7 | None | MYOCARDITIS, HYPERTHYROIDISM. |
| 23 | F 54 | 60.5 | 163½ | A<br>B | 13.53<br>10.36 | 75<br>67 | 71 | 11<br>8 | 10 | 179<br>178 | 178 | -10<br>12 | -11 | None | PERNICIOUS ANEMIA WITH CORD DEGENERATION. |
| 24 | M 30 | 56.6 | 162 | A<br>B | 6.67<br>6.20 | 71 | 71 | 16<br>16 | 16 | 240<br>226 | 233 | +10<br>+4 | +7 | Very Nervous at times | CHRONIC ARTHRITIS; Neurasthenia. |
| 25 | M 22 | 56.4 | 164 | A<br>B | 12.58<br>10.07 | 90<br>86<br>81 | 86 | 14<br>16 | 15 | 217<br>205 | 212 | +5<br>+1 | +3 | More relaxed toward end. | Enlarged Thyroid |
| 26 | F 52 | 48.2 | 161½ | A<br>B | 12.85<br>10.10 | 1111<br>107<br>107 | [illegible] | 15<br>15<br>16 | 16 | 219<br>319 | 219 | +21<br>+21 | +21 | None | HYPERTHYROIDISM, CHRONIC MUCOUS COLITIS. |
| 27 | F 33 | 83.2 | 163 | A<br>B | 11.18<br>8.63 | 90<br>89<br>94 | 91 | 19<br>18 | 19 | 264<br>263 | 264 | +26<br>+26 | +26 | None | MENOPAUSE; General Debility, Following operation. |
| 28 | F 29 | 99.6 | 161 | A<br>B | 13.68<br>10.43 | 59<br>58<br>59 | 59 | 17<br>18<br>18 | 17 | 253<br>250 | 252 | -2<br>-4 | -3 | Moved Hands | OBESITY; Enlarged Thyroid, Hypotensic |
| | | | | | | | | | | | | | | | |

The fluctuation shown in the case of Mr. B. is due to the therapeutic effects of thyroid extract. The correct dose to maintain his metabolic rate within the normal was readily established by a few tests. In this case one grain of the extract three times daily was found to be required.

TABLE I. (*continued*)

| No | Sex Age | Weight Kg | Height Cm | Period | Time (Min) | Pulse | Avge | Resp | Avge | $O_2$ per min c.c. | Avge | Basal Metab. Rate | Avge | Observations Of Operator | DIAGNOSIS Clinical Findings Suggesting Faulty Metabolism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | F31 | 41.6 | 158½ | A<br>B | 13.55<br>10.68 | 111<br>109<br>117 | 112 | 20<br>20 | 20 | 251<br>248 | 250 | +45<br>+44 | +44 | Moved Hands | HYPERTHYROIDISM |
| 30 | F36 | 64.2 | 168.6 | A<br>B | 12.78<br>10.15 | 72<br>70<br>71 | 71 | 14<br>15 | 15 | 188<br>190 | 189 | -13<br>-14 | -13 | None | MIGRAINE, CHRONIC CONSTIPATION |
| 31 | F35 | 65.7 | 156¼ | A<br>B | 10.62<br>7.96 | 60<br>61<br>58 | 60 | 19<br>19<br>19 | 19 | 202<br>190 | 196 | -3<br>-9 | -6 | Suffering-could not keep still. | CHRONIC TONSILLITIS, ALVEOLAR ABSCESS<br>CHRONIC OSTEOARTHRITIS;<br>Neurasthenia. |
| 32 | F26 | 50 | 167.6 | A<br>B | 10.96<br>8.23 | 96<br>94 | 95 | 16<br>15<br>16 | 16 | 222<br>219 | 221 | +12<br>+11 | +11 | Excited<br>Frightened | CHRONIC COLITIS<br>Nervous Irritability. |
| 33 | F48 | 56.2 | 163¾ | A<br>B | 13.53<br>10.73 | 112<br>116<br>112 | 113 | 14<br>14 | 14 | 261<br>268 | 260 | +31<br>+30 | +30 | None | HYPERTHYROIDISM, ALVEOLAR ABSCESSES |
| 34 | M37 | 76.1 | 173-1/3 | A<br>B | 13.70<br>9.85 | 69<br>70<br>70 | 70 | 17<br>17<br>17 | 17 | 231<br>236 | 238 | -11<br>-6 | -8 | None | ASTHMA |
| 35 | F16 | 70.9 | 156¼ | A<br>B | 11.43<br>8.92 | 69<br>70<br>70 | 69 | 17<br>17 | 17 | 222<br>219 | 221 | -1<br>-2 | -2 | None | MANIC DEPRESSIVE PSYCHOSIS |
| 36 | F48 | 61.6 | 162 | A<br>B | 12.58<br>9.16 | 69<br>71<br>68 | 70 | 14<br>16 | 16 | 186<br>182 | 184 | -9<br>-11 | -10 | None | CHRONIC NEPHRITIS |
| 37 | F40 | 75.4 | 169 | A<br>B | 13.58<br>10.15 | 74<br>76<br>79 | 76 | 18<br>17 | 18 | 224<br>224 | 224 | -4<br>-4 | -4 | Moved Hands | HYPERTENSION, CHRONIC ENDOMETRITIS |
| 38 | M46 | 48.6 | 170½ | A<br>B | 11.70<br>8.98 | 72<br>71<br>68 | 70 | 18<br>19 | 19 | 186<br>162 | 174 | -10<br>-21 | -16 | Very Irregular breathing | DIABETES MELLITUS, CHRONIC TONSILLITIS, ALVEOLAR ABSCESSES, PYORRHEA, HEALED FIBROTIC TUBERCULOSIS |

| No | Sex Age | Weight Kg | Height Cm | Period | Time (Min) | Pulse | Avge | Resp. | Avge | $O_2$ per min c.c. | Avge | Basal Metab. Rate | Avge | Observations Of Operator | DIAGNOSIS Clinical Findings Suggesting Faulty Metabolism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | F 56 | 63.0 | 167 | A<br>B | 14.08<br>10.58 | 83<br>79<br>80 | 81 | 19<br>18 | 19 | 254<br>255 | .255 | +18<br>+19 | +19 | None | GENERAL LYMPHADENITIS, MIGRAINE |
| 40 | F 66 | 63.7 | 167 | A<br>B | 11.52<br>9.07 | 82<br>88 | 65 | 12<br>12 | 12 | 199<br>203 | 201 | +0<br>+3 | +1 | Seemed Nervous | CHRONIC FOLLICULAR TONSILLITIS,<br>CHRONIC MUCOUS COLITIS<br>Nerve Exhaustion. |
| 41 | F 42 | 110 | 157 | A<br>B | 9.87<br>7.10 | 66<br>66 | 67 | 16<br>16 | 16 | 266<br>278 | 272 | +1<br>+3 | +1 | None | OBESITY. |
| 42 | F 40 | 49.0 | 168 | A<br>B | 12.70<br>10.03 | 67<br>64<br>65<br>68 | 66 | 24<br>17<br>16 | 19 | 199<br>190 | 196 | +3<br>+3 | +3 | Moved Feet<br>"Tiresome" | Positive Goetsch Test. |
| 43 | M 30 | 69.1 | 171½ | A<br>B | 13.63<br>10.90 | 60<br>60<br>61 | 60 | 11<br>10 | 11 | 235<br>234 | 235 | +1<br>+1 | +1 | None | CHRONIC TONSILLITIS, ALVEOLAR ABSCESS; R. Lobe Thyroid Enlarged. |
| 44 | F 64 | 60.9 | 166.0 | A<br>B | 13.95<br>11.20 | 72<br>71<br>72 | 72 | 14<br>14<br>15 | 14 | 182<br>183 | 183 | -9<br>-9 | -9 | None | PAROXYSMAL TACHYCARDIA, NEURITIS, 8TH NERVE DEAFNESS, AUTO-INTOXICATION |
| 45 | F 61 | 47.4 | 149 | A<br>B | 5.62<br>4.20 | 82<br>75 | 79 |  |  | 245<br>241 | 244 | +52<br>+49 | +49 | Very Nervous | MIGRAINE; Nervous Asthenia |
| 46 | F 38 | 39.6 | 159½ | A | 12.75<br>10.03 | 75<br>73<br>74 | 74 | 20<br>21<br>21 | 21 | 164<br>157 | 166 | -4<br>-2 | -3 | None | PROBABLE CHRONIC CHOLECYSTITIS, CHRONIC CARDIAC DILATATION. |
| 47 | F 33 | 54.6 | 161½ | A<br>B | 10.93<br>8.33 | 60<br>79 | 80 | 16<br>17<br>18 | 17 | 238<br>224 | 231 | +12<br>+6 | +9 | None | CHRONIC ENDOCARDITIS, CHRONIC MYOCARDITIS, SECONDARY ANEMIA (mild) |
| 48 | F 27 | 78.6 | 156 | A<br>B | 14.10<br>11.16 | 92<br>88<br>89 | 90 | 12<br>14 | 13 | 239<br>239 | 239 | +6<br>+5 | +5 | None | CHRONIC CARDIAC DILATATION, HYPOPITUITARISM. |

ning which this class of work, as any clinical work, demands.

This series includes sick individuals of all types, all new, unselected and untrained subjects. A number of them were anything but easy to manage and yet not one of the tests can be regarded as a complete failure, although periods A and B do not always check up closely.

The trial soon proved to be a success. Indeed the results were so satisfactory that when, unfortunately the apparatus was accidentally upset necessitating repairs, I modified, to replace it, one of the older models, housing both air impeller and soda lime absorber *inside* the spirometer, without discarding, however, the three-way valve. At present these apparatus are in constant use, both giving equally satisfactory results.

This modified apparatus (Fig. 2) is in fact a faithful duplicate of the original one from Dr. Benedict, except that the retained base and mountings do not make of it a truly portable apparatus. This feature is essential only, of course, for bedside observations. The soda-lime absorber and electric air impeller have been taken out and are shown in their relative position when in place inside the spirometer.*

This apparatus was used in the next series of observations made with normal trained and untrained subjects. For lack of space, results with only one trained and one untrained subject are reported in Tables II and III and show most admirably the high grade of work made possible with its use.

The technic followed is that described by

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* For directions and assistance to make these alterations in the older type of apparatus, write to W. E. Collins, 584 Huntington Ave., Boston 17, Mass.

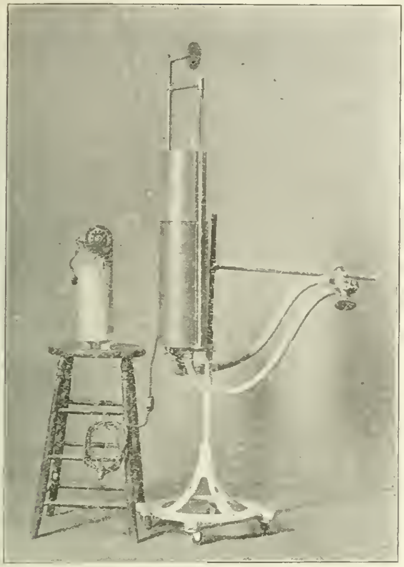

FIG. 2.

Benedict.[3, 7] Being well supplied with stop-watches they were used for timing the periods. I have used an ordinary watch many times with this and other forms of apparatus and know that if need be it will answer the purpose very nicely.

The fact should not be ignored that, if not properly regulated, a stop watch may register incorrect time. When two or more are used they should at least be compared by starting and stopping them simultaneously. They should not vary more than one or two seconds in a 10-15 minute period.

A more serious mistake of a whole minute will readily be made if the "*minute recording* hand" of a stop-watch happens to be inaccurately set. The two hands being superimposed at the starting position, the covered minute recording hand can be as much as one minute off, one way or the other, without it being noticed. Even if this is discovered at the start, a correct final reading can readily become somewhat uncertain.

In Table I, period A was timed first and last, while period B was taken *within* the interval of period A. The readings were taken by Emmes' method in both. This method of running one or more checking periods within a longer one was introduced early in the use of the apparatus in order to compare the one period method as originally run, with one or two shorter periods taken during the same interval by Emmes' method.[3] There seemed to be no reason for a change in our routine even after Emmes' method was adopted exclusively, but recent observations show that *better results are obtained from the average of two or three overlapping*

TABLE II.—BASAL METABOLISM, DETERMINED WITH BENEDICT'S NEW PORTABLE APPARATUS.

N. O. B. Normal Trained Subject. Male, age 39; weight, 60.5 kg.; height, 169 cm.

| July, 1920 | Period | Duration in Min. and Hundredths | Pulse | Respiration | $O_2$ per Min. C.C. | Metabolic Rate Percent of Harris-Benedict Predicted Normal |
|---|---|---|---|---|---|---|
| 13 | A<br>B<br>Avge | 12.57<br>9.60 | 68, 66, 69<br>68 | 16, 15, 16<br>16 | 230<br>223<br>227 | + 5 |
| 14 | A<br>B<br>Avge | 13.03<br>10.03 | 66, 67, 66<br>66 | 15, 16, 18,<br>17 | 216<br>218<br>217 | + 2 |
| 15 | A<br>B<br>Avge | 13.78<br>10.33 | 59, 60, 64,<br>61<br>61 | 15, 14, 15<br>15 | 218<br>216<br>217 | + 2 |
| 16 | A<br>B<br>Avge | 12.38<br>10.02 | 62, 64, 67,<br>64 | 11, 14, 15,<br>13 | 224<br>217<br>221 | + 4 |
| 18 | A<br>B<br>Avge | 12.93<br>10.72 | 64, 64, 68<br>65 | 16, 16, 17<br>16 | 220<br>218<br>219 | + 3 |
| 23 | A<br>B<br>Avge | 13.72<br>11.30 | 67, 65, 66<br>66 | 14, 16, 20<br>17 | 217<br>218<br>218 | + 3 |
| 27 | A<br>B<br>C<br>D<br>Avge | 15.17<br>13.83<br>15.47<br>13.72 | 66, 65, 65,<br>64, 65,<br>63, 62, 64,<br>65, 66, 63,<br>65 | 14, 13, 15,<br>13, 14,<br>14, 13, 14,<br>13.<br>14 | 222<br>220<br>224<br>221<br>222 | + 4 |
| 28 | A<br>B<br>C<br>D<br>Avge | 14.88<br>13.17<br>14.98<br>11.25 | 68, 66, 70,<br>65, 65,<br>66, 65, 65,<br>64, 67,<br>66 | 16, 14, 15,<br>15,<br>13, 13, 14,<br>14.<br>14 | 216<br>215<br>216<br>213<br>214 | + 1 |
| 29 | A<br>B<br>C<br>D<br>Avge | 17.83<br>16.15<br>14.08<br>12.05 | 67, 66, 66,<br>66, 68<br>67, 67, 69,<br>68.<br>67 | 13, 13, 14,<br>13, 13.<br>13, 13, 14,<br>14.<br>13 | 227<br>224<br>231<br>227<br>227 | + 6 |
| 30 | A<br>B<br>C<br>D<br>Avge | 13.68<br>11.67<br>15.60<br>13.18 | 65, 64, 65,<br>64.<br>64, 64, 64,<br>65, 65.<br>64 | 13, 13, 13,<br>14.<br>15, 14, 15,<br>15.<br>14 | 215<br>213<br>217<br>215<br>215 | + 1 |
| Aug. 1920 1 | A<br>B<br>C<br>D<br>Avge | 13.83<br>11.87<br>15.32<br>13.12 | 59, 60, 60,<br>59.<br>61, 61, 60,<br>62. 60<br>60 | 12, 13, 13,<br>13, 13, 13,<br>13, 13.<br>13 | 219<br>220<br>222<br>221<br>221 | + 4 |
| 2 | A<br>B<br>C<br>D<br>Avge | 13.60<br>11.08<br>15.12<br>12.77 | 61, 62, 62,<br>62.<br>65, 62, 61,<br>64, 63, 63.<br>63 | 13, 13, 12,<br>12,<br>13, 13, 12<br>13 | 229<br>215<br>225<br>225<br>221 | + 4 |
| 3 | A<br>B<br>C<br>D<br>Avge | 14.28<br>12.37<br>14.48<br>12.10 | 64, 65, 63,<br>64.<br>63, 65, 64,<br>64.<br>64 | 14, 15, 15,<br>14, 14, 14,<br>15.<br>14 | 217<br>220<br>222<br>221<br>220 | + 3 |
| 4 | 1<br>2 | 10.00<br>10.00 | 68<br>64 | 14<br>14 | * 228<br>* 220 | + 6<br>+ 3 |
| 6 | A<br>B<br>C<br>D<br>Avge | 12.37<br>11.45 <br>15.38<br>13.40 | 65, 65, 68,<br>67, 65.<br>66, 66, 66,<br>68, 68.<br>66 | 13, 13, 14,<br>13.<br>14, 14, 14,<br>14 | 211<br>211<br>215<br>213<br>213 | 0 |
| 8 | A<br>B<br>C<br>D<br>Avge | 13.00<br>11.08<br>12.13<br>10.40 | 66, 65, 66<br>67, 69, 66.<br>66 | 14, 14, 15.<br>14, 14, 13<br>14 | 214<br>214<br>** 222<br>** 222<br>218 | + 3 |
| 9 | A<br>B<br>C<br>D<br>Avge | 13.13<br>10.40<br>14.05<br>11.42 | 65, 65, 64,<br>65, 70<br>66, 66, 68<br>67 | 14, 16, 15,<br>15, 16.<br>15, 16, 16.<br>16 | 210<br>211<br>214<br>213<br>212 | −1 |
| 10 | A<br>B<br>C<br>D<br>E<br>Avge | 12.78<br>10.43<br>14.27<br>12.73<br>9.00 | 64, 66, 66,<br>65,<br>63, 64, 64,<br>64, 65.<br>65 | 15, 15, 14,<br>13.<br>13, 14.<br>14 | 206<br>205<br>210<br>209<br>209<br>208 | −2 |
| 11 | A<br>B<br>C<br>D<br>Avge | 12.43<br>11.49<br>11.90<br>13.30 | 62, 64, 60,<br>64, 64.<br>62, 63, 62,<br>63, 63, 61.<br>62 | 13, 13, 13,<br>14, 14,<br>14, 14, 14,<br>14, 15, 14.<br>14 | 204<br>209<br>208<br>216<br>210 | −3 |

August 4, the Basal Metabolism was estimated with the Respiratory Valve (Tissot) Method by Miss Anna C. Peterson, who observed a like close agreement between the two methods in many comparison tests made recently.

*short periods uniformly timed in close succession and with the spirometer bell operating within fairly uniform levels of travel.*

TABLE III.—BASAL METABOLISM, DETERMINED WITH BENEDICT'S NEW PORTABLE APPARATUS.

J. L. B. Normal Untrained Subject. Male; age, 33; weight, 49.4 kg.; height, 167.5 cm.

| Aug. 1920 | Period | Duration In Min. and Hundredths | Pulse | Respiration | $O_2$ per Min. C.C. | Metabolic Rate Percent of Harris-Benedict Predicted Normal |
|---|---|---|---|---|---|---|
| 23 | A | 11.28 | 59, 58, 59 | 12, 11, 11, 11 | 193 | |
| | B | 10.88 | | | 195 | |
| | C | 10.17 | | | 198 | |
| | D | 10.07 | | | 199 | |
| | Avge | | 59 | 11 | 196 | 0 |
| 11 | A | 10.25 | 59, 58, 58 | 11, 11, | 194 | |
| | B | 10.47 | | | 197 | |
| | C | 10.35 | | | 195 | |
| | D | 10.35 | | | 196 | |
| | Avge | | 58 | 11 | 195 | 0 |
| 30 | A | 10.77 | 54, 55, 54 | 14, 15, 14 | 200 | |
| | B | 10.65 | | | 198 | |
| | C | 10.53 | | | 202 | |
| | D | 9.62 | | | 203 | |
| | Avge | | 55 | 14 | 201 | + 3 |
| 11 | A | 10.50 | 56, 56, 56 | 15, 15, 15 | 192 | |
| | B | 10.75 | | | 190 | |
| | C | 11.40 | | | 190 | |
| | D | 11.48 | | | 191 | |
| | Avge | | 56 | 15 | 191 | -2 |

The subject remarked after the test that he was lying on a bunch of keys in his hip pocket and thus became uncomfortable toward the end of the period. This explains the high results in periods C and D.

## A FEW SUGGESTIONS.

A careful study of the literature referred to in this paper will save much time and trouble for those who undertake the estimation of basal metabolism. The ounce of prevention lies mostly in stepping along intelligently. The apparatus as now modified requires little attention. The chief points to observe are the following:

Test the apparatus daily for possible leakage. If carefully put together a leak may never occur.

The operator should breathe into the apparatus occasionally to assure himself that the circulation of air is unobstructed and the breathing free and easy. The chief causes of obstruction are, (a) too large a quantity of soda-lime in the container, especially when it is too fine and powdery, or when it is allowed to cake. If fine soda-lime is used the container should be only partially filled. The absorber should occasionally be removed from the apparatus, tilted and shaken to prevent the soda-lime from caking; (b) the rubber tubing may be too small or more or less kinked; (c) water, either spilled over from the apparatus, or a result of condensation of moisture in the expired air, may easily occlude dependent loops of the tubing; (d) the air moistener in the mouthpiece assembly unless carefully made, may seriously obstruct the passage of air. I have discarded it without any noticeable inconvenience to the patient.

Accuracy in the volumetric estimation of the oxygen consumption demands that the spirometer readings be taken with a relatively constant amount of $CO_2$ and of moisture in circulation in the apparatus at the start and at the end of the test period. This is satisfactorily insured if the air impeller is run for a few minutes before the test as directed by Benedict, and if also the first reading is not taken until after the subject has breathed into the apparatus for one or two minutes. Occasionally the respiration of the subject is so irregular that it is difficult to take a reading, and accuracy demands that all the reading should be taken with the lungs in a uniform degree of expansion. It is a physiological fact, well confirmed by hundreds of kymographic tracings taken with this type of apparatus, that *the status of the lungs is more constant at the end of expiration than at the end of inspiration, especially when the subject is unconscious of his breathing.* These tracings further show this to be invariably true when the respiratory movements are irregular. Even in extreme cases surprisingly close agreement between successive estimations are obtained when the average of three periods carefully "picked out" are taken in one test.

Variations of temperature call for a correction in the computations which is easily made, but which is intended for short periods of observation only.

As stated before, the spirometer bell should move within fairly uniform levels of travel. In fact, the *duration of a period should be gauged rather by the distance the bell has fallen than by the watch.* A fall of 120 or 130 mm. for each period is about the right measure.

*a.* Recent private communications from Dr. Benedict not only confirm this statement but suggest the following:

The present size of spirometer is larger than necessary for ordinary rest observations. Rather than to fill it and to work with the bell high up in the air it is preferable to start with the spirometer not much more than half-full. This works to advantage in two ways: first, it keeps down the large amount of air subject to temperature and pressure changes, and second, it makes it possible to keep the level of water in the spirometer much lower (12 cm. below the top is recommended), and does away with the danger of slopping water over onto the blower and motor.

The efficiency of the soda lime is to be considered. There are simple ways to detect the presence of unabsorbed $CO_2$ in the air after it has passed through the soda lime absorber, due to the loss of the lime's absorptive power, or this may be indicated also by the resulting noticeable change in the respiration of the subject. When this takes place it means the actual loss of the test period. The safest way is to change the soda lime after every 30 periods, as Benedict suggests, although he states that a container filled with very good soda lime will last for nearly 50 periods, absorbing approximately 200 gm of $CO_2$.

It has been our custom in using Benedict's Universal Respiration Apparatus to remove the mouth-piece assembly and to sterilize it by boiling it after use in each case. This precaution to guard against any possible transmission of infection from one subject to the next, has seemed to be sufficient. Recently, Dr. G. M. Dobbin, our bacteriologist, has made a careful study of this question, the full results of which will be published when completed. Many cultures have been made from the mouth-piece and parts which are sterilized before being used, and also from adjacent parts which are never sterilized, and which had been breathed into for months by patients of all kinds. Water of condensation from these parts was also used for cultures.

So far the only organism grown in cultures thus made, was the common air-borne, nonpathogenic, harmless B. Subtilis, and even this only from parts that are never sterilized. The water of condensation from the rubber tubing which had been in use for a long time, proved to be sterile.

Cultures were made also from the mouthpiece and valve after the subject had indulged in as much coughing as is likely to occur during a test, also with negative results.

It is evident that the chances of conveying infection from one subject to another, are very remote and practically impossible when simple precautions are taken.

*b.* Benedict's spirometer is admirably adapted for the *measurement of vital capacity* which is just now receiving special attention owing to the very interesting work of Dreyer of Oxford. He points to its significance particularly of pulmonary tuberculosis.

### CALCULATIONS.

The calculations are considerably simplified by the use of the following tables:*

1. Table converting temperature from Farenheit into Centigrade readings, from 60° to 110° F.; and, *vice versa,* from 1° to 15° Centigrade.

2. Table of equivalent of seconds in decimal parts of a minute.

3. Table for converting inches to centimeters.

4. Tables for converting pounds into kilograms.

5. (a) A set of six tables giving, "Factors for Reducing Volume of Gases to Zero degrees Centigrade and 760 mm." (From 12° to 40° Centigrade, and from 710 to 770 mm.

5. (b) For those who prefer to calculate with logarithms, a similar set of tables are made, giving the "log. factor" instead of the "factor."†

6. A blank arranged for systematically recording the clinical data and for calculations is necessary. This will of course vary according to the calculation method chosen. Our department will be glad to furnish on request samples of the blanks used in our laboratory. These may serve as a guide for the drafting of a blanket to meet personal needs.

### STANDARDS.

For men and women from the age of 20 and above, we now use the "Standard Multiple Prediction Tables for Normal Basal Metabolism,"[8] without any doubt the most accurate standards available, they enable one to find by the simple addition of two numbers from the tables, what the average normal basal metabolism of any individual should be, in terms of calories for twenty-four hours.

For other ages consult nine and ten of the references.

The reader will find below a number of references to the estimation of basal metabolism in clinical medicine.

For valuable assistance in the perusal of the literature and in the compilation of the bibliography given below I am indebted to Mrs. Lilian Davis, Medical Librarian.

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* In answer to numerous requests, photographic copies of Tables 1 to 5 inclusive, have been compiled by the writer and Miss Anna C. Peterson. These can be obtained either singly or in a complete set, assembled in a loose-leaf binder, from the Photographic Department of the Battle Creek Sanitarium. See above "Calculations" and state in ordering whether 5a or 5b is wanted.

† Just announced: "Tables, Factors, and Formulas for Computing Respiratory Exchange and Biological Transformations of Energy." Carpenter, Pub. 303 Carnegie Institution of Washington, 1921. (In press.)

### RÉSUMÉ.

1. Benedict's New Portable Respiration Apparatus gives most satisfactory results in its use for the estimation of the Basal Metabolic Rate, and of Vital Capacity.

2. Its adaptability and reliability are demonstrated by series of observations on a large number of unselected, clinical cases of all types, as well as on both trained and untrained subjects.

3. Comparisons with more elaborate methods emphasize its simplicity and practicability in clinical work.

4. Suggestions and information relative to technic, calculations, standards, and bibliography are offered.

### REFERENCES.

[1] Benedict, Emmes, Roth and Smith: Jour. Biol. Chem., 1914, Vol. xviii, p. 139
[2] Benedict: Amer. Jour. Physiology, 1909, Vol. xxiv, p. 345. Completely described in this Journal.
[3] Benedict: Portable Respiration Apparatus for Clinical Use. BOSTON MEDICAL AND SURGICAL JOURNAL, May 16, 1918, Vol. clxxviii, p. 667.
Hendry, Carpenter and Emmes: BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxxi, Sept. 4, 11, 19, 1919.
Benedict: BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxxii, p. 243, March 4, 1920.
[4] Benedict, Miles, Roth and Smith: Carnegie Institution of Washington, Publication No. 280.
[5] Tissot: Jour. de Physiol. et de Pathol. Gen., 1904, Vol. vi, p. 688.
Carpenter: Carnegie Institution. Washington, Publication No. 216.
[6] Sandiford: Endocrinology, Vol. 4, p. 71, January-March, 1920.
[7] Benedict: BOSTON MEDICAL AND SURGICAL JOURNAL, Oct. 14, 1920, Vol. clxxxiii, No. 16.
[8] Harris and Benedict: Publication 279 Carnegie Institution of Washington, 1919. "A Biometric Study of Basal Metabolism in Men."
[9] Benedict: The Basal Metabolism of Boys from 1 to 13 Years of Age. Proc. of the National Academy of Sciences. Vol. vi. pp. 7-10, January, 1920.
[10] Benedict: Metabolism and Growth from Birth to Puberty. Carnegie Institution of Washington. In press. Table 34 gives the basal metabolism of boys and girls per 24 hours, predicted from body weight.
Means, J. H.: Basal Metabolsm. BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxiv. p. 864, June 15, 1916; Metabolism in Obesity. Arch. Int. Med.. Vol. xvii. p. 704, May, 1916; Basal Metabolism in Hyperthyroidism. Arch. Int. Med.. Vol. xxiv. p. 404, October, 1919; Hyperthyroidism—Toxic Goiter. Med. Clin. No. America. Vol. iii, p. 1077, January, 1920.
Joslin, E. P.: Diabetes of Long Duration, Severe Diabetes versus Severe Acidosis in Diabetes. Med.. Clin. of No. America, Vol. iii, p. 873, January, 1920.
Boothby and Sandiford: Basal Metabolic Rate Determinations, Saunders, 1920.
Boothby and Bowman: Effect of Thyroid Medication on Renal Function, Nitrogen Balance and Basal Metabolism in Chronic Nephritiss and in Hyperthyroidism as a Guide in Diagnosis and p. 469, October, 1917.
Peabody, Meyer and DuBois: Basal Metabolism in Cardiac and Renal Disease. Arch. Int. Med., Vol. xvii, p. 980, June, 1916.
DuBois, E. F.: Basal Metabolism as a Guide in Diagnosis and Treatment of Thyroid Disease. Med. Clin. North America, Vol. ii, p. 1201, January, 1919.
Abbott, H. E.: Determination of Basal Metabolism by Respiratory-Valve and Spirometer Method of Indirect Calorimetry, with Observations on a Case of Polycythemia with Splenomegaly. Canad. Med. Assn. Jour., Vol. viii, p. 491, June, 1918.
Gardner and Peppard: The Clinical Value of the Estimation of Basal Metabolism. Journal-Lancet, Vol. xxxix, p. 495; Sept. 15, 1919.
Jnoney and Henderson: Concerning the Diagnosis and Treatment of Hypothyroidism. Arch. Int. Med., Vol. xxvi, p. 297, September, 1920.
Snell, A. M., Ford, Frances, Rountree, L. G.: Studes in Basal Metabolism. Jour. A. M. A., Vol. lxxv, 1920, p. 516.
Dreyer, G.: The Normal Vital Capacity in Man and Its Relation to the size of the Body, Lancet, Aug. 9, 1919.
Dreyer, G.: Normal Basal Metabolism in Man and its Relation to the Size of the Body and Age, Expressed in Simple Formulae. Lancet, Aug. 7, 1920.
Dreyer and Hanson: The Assessment of Physical Fitness. 1920. Cassell & Company, New York City.

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# SIDEPATHS IN MEDICINE.*

BY JAY PERKINS, M.D., PROVIDENCE, R. I.

WHEN I was a boy in school, one of the reading lessons was that of some people who, traveling along a main highway, saw an alluring sidepath. They entered it, found it very pleasant, and dallied along until late in the afternoon a heavy thunderstorm came on, followed by darkness. They were lost and spent a terrible night in the woods.

Recently I read a review of a book which narrated the departure of another group from the main civilization into the outland. They, too, found it pleasant, kept going further and further, keeping track of their way by beds of flowers. They, however, were gone for some time, long enough so that the flowers changed with the season, and when they tried to find their way back, the marks had been obliterated, and they, too, were lost. They, however, had found the new country so beautiful and satisfying that they were content to remain there, and gave up seeking to find the way out.

In medicine we have the straight road traveled for centuries; we have the established modes and lines of thought, and he who travels within these limits is safe, and many are satisfied. There are, however, from this main road of established routine many sidepaths and many outlands. In fact, all the specialties are, or have been, sidepaths, and beyond the former realm of medicine. The Hippocratic oath forbade certain lines of surgery. Now, even surgery has its sidepaths, as abdominal surgery and brain surgery. The familiar specialties, the eye, ear, nose, and throat, obstetrics and the others, are sidepaths used but comparatively recently, but now are well-worn, and considered as main roads. There are numerous other sidepaths; some may lead into swamps, some into briar patches, some into woods, but, until we travel them, we do not know but that these, too, may lead into fertile fields. For instance, bacteriology; I can remember while I was a student, there were many who questioned germs being the cause of disease. I was one of the two students who first took bacteriology as an elective course counting on a degree in the Harvard Medical School. Bacteriology was then a comparatively little used sidepath. Now it is a main dependence in the practice of medicine. When I entered the Rhode Island Hospital, I brought the first oil immersion lens that was ever at the hospital. The only laboratory was a little room, at one time a part of the dispensary. Now it would be hard to carry on the work of the hospital without its laboratory.

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* Read before the Providence Clinical Club.

The x-ray is another more recent sidepath, the value of which we do not yet know. In both of these, bacteriology and the x-ray, some things which were formerly shrouded in darkness were made clear, and because of these successes, great hope and reliance were placed upon them, much greater than later developments have justified.

The same is true in reference to blood examinations and physiological chemistry, especially as relating to work of the stomach. All of these things are of great assistance, and have helped to put medical work on a more solid foundation; but even at that, they have not been an unmixed blessing. They have caused us to depend too much upon these objective evidences of health and disease, and to neglect too much careful observation of clinical symptoms, and have made the practice of medicine too much the exercise of scientific formulae and too little of human thought.

There are other sidepaths not in such good repute, as Homeopathy, Christian Science, and Osteopathy. Some of these lead into the wilderness of the unknown, or into swamps and briar patches, but not all knowledge gained through them is useless. The harm comes in that the travelers entering them have no knowledge of the main highway, and think that these paths are the only ones, and are able to persuade others to their way of thinking. Time and education alone can restore them to the road of science and common sense, but in the meantime, they are adding something of value to our knowledge, if we will but learn. At present, the devotees of these various methods of treatment are content with the outland to which they have gone, and have no desire to return; but is it not the fault, in part at least, with the regular medical profession for failing to observe and practise, to teach in the schools observation and practise, of all that it of benefit to the sick and ailing, instead of practically denying that which cannot be demonstrated in the laboratory, or proved by experiment?

MacKenzie has forcefully called attention to the present condition of putting younger men into the out-patient work in our hospitals, and having experienced men in the wards, thus putting upon those without experience, the task which they are incompetent to handle, of recognizing the early stages of the disease, and giving to the supposedly experienced observers, the handling of the very sick in whom the signs and symptoms are marked. The young men who have the task of recognizing disease by its early symptoms have been trained in the hospital wards, and in the laboratories, and have learned to put their dependence upon physical signs and laboratory examinations, and in the rush of a busy clinic, they do not take the time to study the cases from any other standpoint. Now, I think we can go a step farther, and, following the old adage, "As the twig is bent, so the tree is inclined," say that the majority of these men never get much farther than to base their diagnoses largely upon physical signs and analyses.

The study of pathology is an absolute necessity to one who would have a knowledge of medicine, but if we get into the habit of thinking a disease must present the pathology as taught and seen in the autopsy room before we make a diagnosis of that disease, we are many times of very little use to the patients, because we fail to recognize the nature of their ailments while they are yet in a curable stage. In recent years, more attention has been paid to the functioning of organs, and by this means, a marked advance has been made, which is of benefit to the patient; but even here, the study of functioning has been through laboratory experiments, and only the more marked cases of abnormal functioning have been demonstrated.

The sidepath which I wish to call to your attention tonight is endocrinology. In the student days of most of us, we were taught that there were such glands as the pituitary, thyroid, thymus, adrenal and the ovaries. The part played by these glands in the economy of the system was about as vague as was the use of the appendix. Recently, however, much study has been given to them, and an effort made to determine their functions. This has been done either by giving the dried gland substance or its extracts, and the observing physiological effects produced, or by removing the glands and observing the changes which take place.

In this paper I shall limit myself to the thyroid. The extremes in abnormal thyroid states are exemplified on the one hand by exophthalmic goitre, and on the other by cretinism or myxoedema. These do not enter into the scope of my studies. My studies have been for the most part on cases which do not present the marked symptoms produced by toxic amounts, or the complete absence of the thyroid extract, but on cases in which the abnormal variations are slight, yet enough to produce abnormal symptoms, especially with reference to asthma. It is my belief that many cases of asthma are due to an abnormal functioning of the thyroid, and manifested before the changes in functioning can be determined by the tests on metabolism. I have long believed that many cases of asthma were due to some abnormality of the nervous system, though what the abnormality is, I did not know. I have never been satisfied with the theory that asthma is due to a special sensitiveness to certain proteids, although I have been ready to acknowledge and treat cases on the basis that certain proteids may bring on the attacks; but,, just as nervousness or an abnormal functioning of the sympathetic nervous system is unsatisfactory in that it does not explain the origin of the trouble, so is this sensitiveness to proteids unsatisfactory in that there must be something to cause this abnormal sensitiveness. For a couple of years, I have stopped paying much attention to the proteid sensitiveness, but have tried to find some deeper explanation which will account for both the sensitiveness to the proteids and the asthma.

I am studying the question from the stand point of the endocrine glands. I have had sufficient success using the thyroid as a basis, so that I am now working chiefly with that. I have not, however, reached such a point that I am ready to make any categorical statements or to claim that I am going to cure all cases of asthma; but I am giving you this as an informal statement as to what I am doing, and what results I have obtained. I know that there are many who hold that the metabolic test is necessary before we can make statements as to the excess or deficiency of the thyroid secretion. With this I do not agree. Not that the test is not of value when we get positive results, but that the test is not sufficiently delicate or pathognomic for the early cases, which, however, are sufficiently abnormal to cause asthma. I am much interested in the article in the *A. M. A. Journal* of April 10, by Dr. Woodbury of Clifton Springs, N. Y., reporting twenty-nine cases of hyperthyroidism operated upon between July 1, 1919, and January 1, 1920. He divides this group into two main types; first, the severely toxic cases showing marked positive epinephrin chloride reaction, and increased metabolic rate varying from 20 per cent. to 85 per cent.; second, a type showing symptoms milder in degree and without exophthalmos. The second type responded positively to the epinephrin chloride test in varying degrees, but showed a metabolic rate which was low, or not increased above the limits now accepted as normal. He further states "that there is a rather large group of patients who are in a definitely impaired physical and nervous condition, who, because of a toxic state of probable thyroid origin, are in need of positive medical or surgical aid, and yet whose metabolic rate is not increased."

Now, coming back to MacKenzie, I believe here is an instance in direct line with his argument for more exact clinical observation and study of symptoms without reliance upon physical signs and laboratory tests. Although I have been studying this for some time, I am not yet able in many instances to differentiate between the hyper- and the hypo-thyroid cases except by therapeutic tests. At one time I thought I had some fairly good symptoms for differentiation, but they failed me. While I can guess nearer than I used to, I cannot positively tell. The physical standard of an enlarged thyroid by itself is of no value, for as you all know, this enlargement may be an increase in the gland, the thyroid substance proper, or it may be the result of disease, impairing the function. Headache, I used to consider as an indication of hyperthyroidism; but the worst headache I have ever seen, was due to hypothyroidism. A condition of nervous excitement is common with hyperthyroidism, but I have seen it with hypothyroidism. A sluggish condition accompanied by inability for marked mental or physical exertion, I associated with hypothyroidism; but I have seen it a number of times with hyperthyroidism. And so it is through the whole list of symptoms which these people may give, so that at the present time, it seems to me that the symptoms obtained by both hypo-and hyperthyroidism are due to instability of the nervous system produced by the abnormal functioning of the thyroid without, so far as I can yet determine, anything pathognomonic of either state.

Before going on to report some asthma cases, I will state that my interest in this subject was first aroused by some functional heart disturbances and my medical treatment of the hyperthyroid cases has followed the line which I used with some success in treating certain functional heart disturbances. An interesting incident, while treating one of these cases, though at the time I did not associate the patient's condition with the thyroid gland, has helped me more than once since. This patient was sent to me by a gynecologist for treatment of the heart condition. I was enabled to relieve the heart condition, and at the same time, she got well of a membranous colitis which she said the doctor who sent her to me had never been able to relieve. I have since tried this method of treatment on several patients with a diarrhea which others had never been able to relieve by ordinary methods. One was a patient at the tuberculosis clinic this year who had been a sufferer from diarrhea for years without getting any relief, and was sent to me to investigate as to tuberculosis. Within two weeks, his diarrhea was completely relieved. Another, a patient in my office, came to me with practically the same history, and she, too, was relieved of the symptoms of diarrhea. After a few weeks, she came back with some return of the trouble, though with nothing like the previous severity. I have not seen her since, and whether this symptom has remained in abeyance, I do not know. Another case of extreme interest to me was a child eleven years of age, whose mother, grandmother and aunt were extremes of the so-called nervous type. Both parents died of pneumonia. Among other symptoms the child suffered from a diarrhea which the physician living near them in the country was unable to relieve. She was taken to another physician at a distance, who diagnosed the case as tuberculosis. The child was living with an aunt and her husband who are relatives of mine. As soon as the diagnosis of tuberculosis was made, they consulted me, and the aunt being a trained nurse before marriage, I got an excellent description of the child, and felt that I could say her trouble was not tuberculosis, and that it probably was hyperthyroidism. I treated her upon this basis, and am pleased to say that the diarrhea disappeared, and there has been a marked improvement in the child, so that she is now not only free from her diarrhea, but able to attend school regularly, which she could not do before, and is much better in every way. One time this winter the medicine I sent failed to reach them, and she herself felt the lack of it so much that she sent word to me that she wished I would send her some more, because it made her feel better. In the children, I believe, my experience enables me to say that after a time, the treatment can be discontinued gradually, giving it only temporarily, as symptoms appear, and ultimately, the child will become normal. These instances I mention merely incidentally with a suggestion for further observation and study.

The treatment of the hypothyroid cases is easy. The treatment of the hyperthyroid cases in the early stages is not so simple. When the disease is advanced, the problem is a different one, and I do not consider it within the scope of this paper. If the symptoms are pronounced, and have lasted for a long time, I cannot believe that medicine holds any great hope for cure. I have sent a number of these cases to Dr. Peckham for x-ray treatment, and have been pleased with the results. It seems to me that in the milder cases, the over-activity of the thyroid is often intermittent, and, as we know, the activity of the thyroid is increased by any excitement, either mental or physical; that this increase of over-functioning is progressive; that, taken at its beginning, this increase in thyroid activity can be lessened by medical treatment, and its ordinary subsequent progress and climax or explosion can be prevented. In youth, this regulation for a time, I believe, may be sufficient to establish a normal stability and thus, if these symptoms can be recognized early, many cases can be prevented from becoming life-long invalids.

As I have stated, my treatment of these cases started before I had any clear idea of what I was treating, and I have continued the same method with a good deal of success, but on the theory that hyperthyroidism is the probable cause. The generally accepted medical treatment of hyperthyroidism is rest. This needs to be mental as well as physical, and this I try to employ in these milder cases, as far as is practicable, varying the degree of rest in accordance with the severity of the symptoms and the environment of the patient. My further treatment is the use of some drug of the sedative group. Bromides I have not found satisfactory. A probable explanation of the action of a sedative is both to lessen the secretion of the thyroid gland, and to lessen its effect upon the nervous system, and thus in two ways lessen the effect upon the organs of the body. Before the war, I used a combination containing asafoetida, sombul and apomorphine. During the war, the drugs were not obtainable except at exorbitant prices, and then were unreliable, and I fell back upon the old formula containing camphor, hyoscyamus and valerian, and recently I have used hyoscyamus, valerian and sombul. I am hoping to find something better, but the results I have to report were obtained by these. I sometimes use iodine, though I am not satisfied as to its benefits. I use it because of its advocacy by others upon the theory that the function of the thyroid gland is largely to furnish iodine, and that if this is furnished in some other way, the necessity for the gland's activity will be lessened, and the secretion will lessen, and the toxicity will become less. The most evidence I have in favor of it is that I have relieved many cases of asthma in children by the use of iodine and a tonic, my favorite being iron and calcium phosphate. In the treatment of adults, both in the hyper- and hypothyroidism in the cases under consideration, I also use a tonic; but have learned that in the hyperthyroidism, the symptoms are aggravated by anything which contains strychnine.

The following cases are mentioned as examples of results in asthma on the basis of endocrine gland treatment:

Case 1. L. L., male, aged 11. Maternal great-grandmother had asthma; also, probably, maternal aunt. Began to have asthma November, 1912. Tonsils and adenoids removed 1913, without any improvement. Has trouble winters; no asthma summers. Tested thyroid and found supersensitive; then given sedative treatment as described above, and now, one year later, is getting along very nicely. Has had no severe attack since beginning present line of treatment ten months ago.

Case 2. M. E. B., female, aged 54. Always had bronchial trouble; asthma for ten years; came on gradually, now constantly for a year; tires easily; terrible pounding headaches mornings and evenings five years ago, then they left for a short time; steady all summer. Feet always cold. Burning asthma powder at night. Given varium, 5 grains, three times a day. She now reports it seems good to feel like going somewhere and seeing people; never used to go anywhere or see anyone. If people came to the house, she wanted to get away from them. Now has no occasion to burn asthma powder, and but very little trouble in breathing.

Case 3. J. H., male, aged 41. Began to have asthma, 1914. Seen by me, April, 1917, in an attack which started about December, 1916. Attacks would come on at 6 or 7 p. m.; get worse after going to bed. Again he would awaken 2 to 4 a. m. Burning an asthma powder and using Tucker's Asthma Remedy. When I saw him, he had just returned from a southern resort, where he had been given an autogenous vaccine, a bottle of which he brought home, and which I started to use on him. Following the second injection, he had a severe chill, and his condition became much worse, so that he was kept in bed, and had a trained nurse. I then found the temperature was running 95 to 97, and that he had always been extremely sensitive to the cold. He was put on thyroid extract, maximum dose, 2½ grains three times a day. After one month's treatment, he was nearly recovered, and had warm hands and feet for the first time at that season of the year. By using a small amount of thyroid, he has kept in good condition since.

Case 4. E. P. B., male, aged 20. Had influenza nine months ago; bronchitis and asthma since then. Has to sit up some at night. Troubled with cold hands and feet; has headaches. Temperature, 97.6; pulse, 72. Was never very active physically; is effeminate in appearance and voice. Was given thyroid extract, 2½ grains; gradual improvement until at the end of three months, the temperature was normal for the first time. He felt better, but was still nervous; not sleeping well. Two months more and there was marked improvement; the voice became more masculine. One year from the beginning of treatment he was perfectly well; temperature normal; taking 2½ grains thyroid extract every twenty-four hours.

Case 5. B. G., aged 11. Eczema since a baby. Asthma since four years of age. Perspires easily; headaches occasionally; car sick on electric or steam cars or in closed automobile. Given iron and calcium phos., camphor, hyoscyamus and valerian. Six weeks later, mother reported child was having no trouble; had a cold recently, but no asthma; that she is a completely different child: more even disposition, skin clear and cheeks red; does not get so nervous in school work; is much better natured; stands much more from brother two years older; fools more with him instead of getting into tantrums.

Case 6. A. F. C., male, aged 47. Had bronchial trouble 17 years; more severe last five or six years; worse at night between 2 and 3 a.m. Headaches two weeks steady, off and on, for years. Perspires easily; considerable tremor to hands. Never could eat eggs or bananas without much distress. Given thyroid as test, and found supersensitive. Given sedative treatment as above, and at the end of five months, can eat eggs and bananas freely. No longer has that "tired and dragged out feeling." Instead of coughing for an hour, he coughs about fifteen minutes at 3.30 A. M., and about ten minutes on getting up. The rest of the twenty-four hours, he is very comfortable.

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## CASES IN WHICH BASAL METABOLISM MEASUREMENT IS USEFUL.

By Oliver H. Stansfield, M.D., Worcester, Mass.,
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The splendid results from investigations into the normal and abnormal physiology of the thyroid gland have given us a more definite knowledge of the diseases of that organ. This is especially true of states of hyperthyroidism, in which estimation of basal metabolism provides a standard for judging severity, hence for a more uniform plan of treatment, and for accurately following progress.

The diagnostic value of measurement of the basal metabolism is also very great, particularly in that large group of ailments, the neuroses, and in clarifying such cases as contain a thyroid element of unknown influence. Examples of these obscure cases are presented in abstract, below, and, although notes cannot convey the sharp impression made by observation, yet they do show in what type of case, knowledge of basal metabolism is useful, or, in view of the lack of adequate clinical criteria, is even necessary.

Case 1. A woman, 42 years old, complained of headache and nervousness of eight months' duration. The headache recurred frequently, and was "dizzy, not violent." Irritability of temper, nervousness, attacks of palpitation of the heart, and dyspnoea on exertion also were present. During the first two months of illness she received twelve doses of arsphenamin and then was advised to follow a course of mercurial injections, and had her teeth extracted. No improvement was noted after this treatment. She had lost fifteen pounds in weight. Her appetite was good. There were no gastrointestinal symptoms. No menstrual disturbance was noted. The past history was unimportant.

On examination, psychic instability was evident. There was a periodic widening of the eyelids, causing a transient stare, but there were no other eye phenomena. No tremor of tongue and only a very slight tremor of the fingers was present. The thyroid was not enlarged, but was quite soft. The heart was negative; the rate during fourteen days, from 78 to 94. The blood Wassermann was negative. There was no lymphocytosis. A prolonged high blood sugar followed oral administration of 100 gm. glucose. X-ray showed a moderately enlarged thyroid, but not intrathoracic. The basal metabolism was 152% above normal.

The several points of interest in this case are: the, to palpation, normal-sized soft thyroid, the transient stare, the absence of frank signs of hyperthyroidism, especially the absence of tachycardia. The consistency of the gland would seem to be connected with the disturbance of function, but without microscopic examination nothing can be stated on that point. The transient stare is perhaps a forerunner or abortive form of exophthalmos and is probably as significant. The absence of outspoken tremor and tachycardia, particularly the latter, are features to be particularly noted, for they are apt to lead to error, as in this case, the final suggestion as to diagnosis having come from the brief stare. From the above, it seems necessary to add hyperthyroidism to the possible causes of neurasthenia.

Case 2. A Russian Jewish woman of 40 years, whose complaint was nervousness and weak spells. She was referred by her physician, "largely for the sake of the family." For five months she had suffered from a soreness in the epigastrium, with frequent feelings of weakness. She has had nocturnal attacks of gasping for breath, accompanied by a tight feeling in the chest. Her appetite was poor; she was constipated, but had no other gastrointestinal symptoms. She worried about the housework and, apparently, everything else.

The past history suggests a longer duration of the condition than five months, inasmuch as she had frequent headaches since a motor car accident three years before. A miscarriage five years before had resulted in a shorter intermenstrual period.

On examination, she was anxious and depressed. There were no ocular abnormalities. The thyroid was somewhat enlarged, firm and smooth, with no *bruit* audible over it. The heart was not enlarged, had but a poor muscular tone to the first sound of the apex, and a rate of from 70 to 86, during three weeks. There was no tremor of tongue or fingers. The hands were cold and moist. The blood Wassermann was negative. A lymphocytosis of 57% was found. X-ray examination of gastrointestinal tract was negative save for slight general ptosis. The basal metabolism was 111% above normal, and again six days later, it was 113% above normal.

Except for the enlarged thyroid, this patient seemed to present no signs pointing to the gland as responsible for her condition, the blood picture not having been correctly assessed. Nevertheless, she was suffering from a marked hyperthyroidism, as shown by the basal metabolism. The consistency of the thyroid in this patient is in contrast to that of the first case. This patient also had a relatively slow pulse, as in Case 1, but in addition, gave evidence of some heart muscle weakness, possibly because of longer duration of the disease. In any event, it is necessary to detect hyperthyroidism, under these circumstances, as early as possible, as there is less favorable response to treatment, than when a proportionately rapid pulse is present.

(Such instances as these suggest that perhaps Xanthippe may have been hyperthyroid, and that similar modern personalities may be remediable, to a certain extent.)

Case 3. A youth of 20 whose complaint was goitre. Four months before examination, he noticed palpitation of the heart, and was found to have an enlarged thyroid. He had felt no dyspnoea, and had retained his equanimity. At the time, he was working at heavy work for 80 to 85 hours a week. His appetite was good, and he had no gastrointestinal symptoms. The palpitation disappeared after a few weeks and did not reappear.

The thyroid was normal, except for a slight soft enlargement of the right lobe. There was no tremor of the tongue or fingers. The heart was negative; rate 72. There were no abnormal eye signs. The skin was warm and dry. The basal metabolism was 6% above normal. Six weeks later, during which interval he had pursued his studies at a technical school, he still presented no symptoms, and the thyroid seemed to be smaller than before.

This patient required no active treatment for hyperthyroidism, in spite of the suggestion from the enlargement of the gland and the palpitation.

It remains to be seen whether the retrogression in this case is permanent or a remission. The occurrence of retrogression of this sort, with the patient under a considerable mental strain, is interesting because of theories of causation of hyperthyroidism.

Case 4. A man of 27 years. Complaint, "Anemia." The patient supposed himself anemic since he was pale and lacked zest for life in general. He felt a fluttering of his heart frequently, and was dyspnoeic on exertion. He had frequent headaches and was tremulous after excitement or exertion. He had lost no weight.

The patient had done front line duty with the A. E. F., until he acquired a chronic bronchitis, for which he still received low compensation.

Appetite was good; he was a "faddist" on the healthy diet. On examination, the man was pale by reason of complexion, but not anemic, thin and somewhat anxious looking. He was a rather too conscientious person, and lacked self-confidence. The eyes were normal. The thyroid was slightly and uniformly enlarged. There was no tremor of tongue or fingers. Lungs and heart were negative; pulse rate, 80. The patient flushed easily. Basal metabolism was 4% above normal.

Apparently the enlarged thyroid in this patient did not indicate toxicity. This is interesting, since the diagnosis of effort syndrome seems proper.

Case 5. A girl of 16 years. Complaint, rapid and forceful beating of the heart. After severe tonsillitis six months before, she had noticed this rapid heart beat, and had become irritable, nervous and listless. The thyroid had enlarged at this time. Her appetite was poor. She was constipated but had no other gastrointestinal symptoms. She had lost weight. Frontal headaches occasionally appeared.

On examination, the patient was depressed. The eyes were normal. There was no tremor of the tongue or fingers. Slight cyanosis of the finger-tips was noted, the hands being cold and moist. The thyroid was moderately and uniformly enlarged, somewhat soft, without *bruit*. The heart was enlarged to the left, and presented presystolic and diastolic murmurs at the apex; pulse, 132. The lungs were clear. No edema. Basal metabolism, 17% above normal. After eight days' rest, the pulse was 132.

This girl had evidently acquired a mitral stenosis at the time of the tonsillitis, as well as an enlarged thyroid. The absence of signs of heart failure pointed to the tachycardia as probably due to the thyroid. The basal metabolism was slightly above the normal variation (10% below or above) and seemed to prove this theory. The poor response to a short rest may be additional proof. In any case, this is a good illustration of the aid received from estimations of basal metabolism in obscure cases.

These brief notes serve the purpose of showing wherein lies some of the value of basal metabolic determinations. Another point to be brought out is, that once the possibility of hyperthyroidism in aberrant form is realized, the number of examples is seen to be great, and therefore, important. In addition, there arise for solution, many very interesting problems.

## Book Reviews.

*Chronic Traumatic Osteomyelitis.* By J. Renfrew White, N.B. (N.E.), F.R.C.S. New York: Paul B. Hoeber. 1919.

The prophylaxis of osteomyelitis presents a problem which, although many claims for its solution have been advanced during the course of the war, yet still is attended by many difficulties. Reports have been made of successful results obtained by various workers, yet the author of "Chronic Traumatic Osteomyelitis" believes that these cases doubtless refer to operations performed under especially favorable circumstances. There are, at the present time, in all the countries which have been engaged in the war, thousands of men suffering from chronic osteomyelitis; the unprecedented number of these cases emphasizes the urgency of considering thoroughly the pathology and treatment of this disease. This book has been prepared in the hope of offering to the profession some assistance towards the realization of an adequate method of dealing with this disease. The author has considered the physiology of the bone, the phenomena of osteomyelitis, the pathology of compound fractures and of chronic traumatic osteomyelitis, the chemical course of chronic traumatic osteomyelitis and the general principles and details to be followed in the treatment of chronic traumatic osteomyelitis. The book is illustrated by excellent plates, and contains the records of a number of cases.

*Use of Factory Statistics in the Investigation of Industrial Fatigue.* By Philip Sargent Florence. New York: Columbia University. 1918.

The importance of the relation between fatigue and industrial activity is being recognized more and more as a matter not merely of personal concern to the worker but also as a vital economic element. At the present time, the subject is being systematically investigated by organized workers who are testing by practical experience methods which may or may not prove to be theoretically sound. A statistical survey of industrial fatigue in factories has been made by Philip Florence, and his methods of research, presented in this volume, *Use of Factory Statistics in the Investigation of Industrial Fatigue*, will be of interest and value to workers in this field. The statistical method involves several steps before the actual data may be obtained; a general visit to the factory is necessary and industry must be prepared for statistical investigation before the facts can be collected from the record books; then individual methods must be generalized and the data explained on some basis of cause and effect. The elements of fatigue and its relation to the human organism and working capacity, as well as various industrial systems in which are involved factors which may predispose the human organism to fatigue, are clearly presented in this volume. Three methods of investigation are mentioned and compared: (1) laboratory experiment, (2) observation of actual conditions, and (3) the statistical method. It was the statistical method which was employed in this investigation for the purpose of discovering variations in working capacity and the influence of length and intensity of activity, the process of learning by experience, factory conditions, the type of worker, and the nature of the work on industrial output. In the task of determining the position of the human element in the factory and in the industrial system, this book should be of considerable assistance.

*The Establishment and Conduct of a Tuberculosis Sanatorium.* By Charles B. Slade, M.D. New York: Bureau of Public Health Education. 1918.

A monograph recently published under the auspices of the New York City Department of Health describes *The Establishment and Conduct of a Tuberculosis Sanatorium.* It is helpful to have this information readily accessible in one volume. The author has based his observations on his personal experience as Examining and Visiting Physician to the Municipal Sanatorium at Otisville, N.Y., and presents in systematic form the information necessary to establish and conduct a tuberculosis sanatorium. The writer believes that a tuberculosis sanatorium should have three primary objects: treatment, education, and segregation; that fundamental principles involved in the treatment and control of tuberculosis include mainly, the discovery of existing cases, treatment of existing cases, and the prevention of new ones. In planning an institution where these objects can be attained there are many factors which must be taken into consideration: the site, with attention to the climate and altitude, contour of ground, water supply, soil, vegetation and shade; and the plan, with provision for the ultimate accommodation of not less than one to three per thousand of the population of the community for which it is established, with a reception unit, a men's unit, a women's unit, a children's unit, and an administration unit. Illustrations and detailed description of these units are included in this book. In the conduct of a tuberculosis sanatorium, the administration and staff, the selection of patients, their physical care, routine work, exercise, food, education, and recreation are some of the problems which the author of this book has set forth. The information presented in this volume, together with illustrations, and charts and record forms used at the Municipal Sanatorium at Otisville should be of interest and value to those who desire to promote the care and treatment of tuberculous patients.

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## BOSTON MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

We have received recently notes regarding the activities of the Committee of Arrangements for the Boston meeting of the American Medical Association on June 6, 7, 8, 9 and 10. The following events have been planned tentatively:

On Wednesday evening, June 8, there are to be banquets connected with reunions of various organizations which will meet during the session of the American Medical Association. It is hoped that a large number of war organizations will meet at the banquets on that evening. From nine to ten o'clock, there is to be given a reception to the Association at the Boston Museum of Fine Arts, by the Trustees; this hospitality is greatly appreciated by the Committee.

Excursions to places of historical interest in and near Boston have been planned for June 8, 9 and 10. On the afternoon of June 8, the Committee of Arrangements will give a tea at the Harvard Medical School; this will afford members of the Society an opportunity to inspect the buildings. On the afternoon of June 9, there will be excursions to the estates of the Honorable Larz Anderson, Professor Sargent, and the late Mr. Louis Brandegee. On Thursday evening, there will be a reception to the President in Mechanics Hall. It is hoped that on Thursday, June 9, an excursion to Plymouth may be arranged.

The following physicians are included in the General Committee of arrangements:

Committee of Arrangements: Chairman, Dr. Fred B. Lund, 527 Beacon Street, Boston; Secretary, Dr. Richard H. Miller, 8 The Fenway, Boston.

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General Committee, 56 Members.

Sections and Section Meeting Places: Chairman, Dr. William H. Robey, Jr.; Secretary, Dr. H. A. Nissen, 205 Beacon Street, Boston.

Fifteen Sub-committees, with the following chairmen and headquarters: Medicine, Dr. D. L. Russell, Somerset; Surgery (General and Abdominal), Dr. F. H. Lahey, Lenox; Gynecology and Obstetrics, Dr. R. Wadsworth, Touraine; Ophthalmology, Dr. G. S. Derby, Vendome; Laryngology, Dr. D. C. Greene, Brunswick; Diseases of Children, Dr. J. L. Morse, Parker House; Nervous and Mental Diseases, Dr. J. B. Ayer, Young's; Urology, Dr. R. F. O'Neil, Westminster; Dermatology, Dr. C. J. White, Copley Square: Preventive Medicine, Dr. M. J. Rosenau, Bellevue; Orthopedic Surgery, Dr. R. J. Osgood, Adams House; Gastro-Enterology and Proctology, Dr. F. W. White, Essex; Pathology and Physiology, Dr. W. B. Cannon, Bellevue; Pharmacology and Therapeutics, Dr. Reid Hunt, Copley Square; Stomatology, Dr. E. H. Smith, Parker House.

Scientific Exhibits: Dr. Cecil K. Drinker, Chairman.

Sub-committee 1. Dr. Drinker. (Exhibit by Dr. Benedict.)—Sub-committee on historical loan exhibit of medical and surgical instruments.

Sub-committee 2. Public Health Exhibit.

Sub-committee 3. Commercial Exhibit; Dr. W. R. Morrison.

Hospital Clinics: Chairman, Dr. Joshua Hubbard; Secretary, Dr. Richard S. Eustis, 355 Marlborough Street, Boston.

Registration Badges, and Bureau of Information: Chairman, D. A. S. Begg; Secretary, Dr. Samuel R. Meeker, 784 Beacon Street, Boston.

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Guide-Book Committee: Chairman, Dr. Walter L. Burrage.

Printing: Chairman, Dr. Daniel Fiske Jones; Secretary, Dr. George Gilbert Smith, 352 Marlborough Street, Boston.

## MEDICAL NOTES.

Dr. Selskar M. Gunn in the Service of Czecho-Slovakia.—Dr. Selskar M. Gunn has been appointed by the government of Czecho-Slovakia as technical adviser to the ministry of public health and physical education. Dr. Gunn was formerly associated with the Massachusetts Institute of Technology; for the past three years he has been associate director of the International Health Board of the Rockefeller Foundation. Dr. Gunn has sailed for Europe, where he will remain for an indefinite period of time.

Tribute to Major-General William C. Gorgas.—At a meeting held under the direction of the Southern Society of Washington on January 17, tribute was paid to the memory of Major-General William Crawford Gorgas by representatives from Latin-America, France, Great Britain, and the United States, for his achievement in the struggle against yellow fever. Among those who expressed appreciation of his work were Adjutant-General Peter C. Harris, Secretary Newton C. Baker, J. E. Lefèvre, chargé d'affaires of Panama's legation; Minister de Sespedes, A. de Alençar, ambassador from Brazil, and Minister Elizalde of Ecuador.

The New York Post-Graduate Medical School and Hospital.—The New York Post-Graduate Medical School and Hospital announces that there will be available this year six scholarships under the terms of the Oliver-Rea Endowment. The purpose of the Endowment is to award scholarships to practising physicians of the United States, to defray in full the expenses of tuition at the New York Post-Graduate Medical School. According to the wishes of the donor, physicians in the State of Pennsylvania will receive preference in the award of these scholarships. Applications may be sent to the President of the New York Post-Graduate Medical School and Hospital, 20th Street and Second Avenue, New York City.

The Parkin Prize.—In terms of the bequest made to the Royal College of Physicians of Edinburgh by the late Dr. John Parkin, Fellow of the College, a prize is offered for the best essay on certain subjects connected with medicine. The subject for the essay for the present period is, in the terms of the deed: "On the efforts of volcanic action in the production of epidemic diseases in the animal and in the vegetable creation, and in the production of hurricanes and abnormal atmospherical vicissitudes."

The prize is of the value of one hundred pounds sterling, and is open to competitors of all nations. Essays intended for competiton, which must be written in the English language, to be received by the Secretary not later than 31st December, 1921. Each essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside, and the author's name inside. The successful candidate must publish his essay at his own expense, and present a printed copy of it to the College within the space of three months after the adjudication of the prize.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending February 19, 1921, the number of deaths reported was 222 against 483 last year, with a rate of 15.28 against 31.16 last year. There were 35 deaths under one year of age against 81 last year.

The number of cases of principal reportable diseases were: Diphtheria, 84; scarlet fever, 85; measles, 69; whooping cough, 26; typhoid fever, 2; tuberculosis, 42.

Included in the above were the following cases of non-residents: Diphtheria, 20; scarlet fever, 7; measles, 5; tuberculosis, 7.

Total deaths from these diseases were: Diphtheria, 3; measles, 2; whooping cough, 1; tuberculosis, 18.

Included in the above were the following cases of non-residents: Diphtheria, 2 tuberculosis, 2.

Encephalitis lethargica cases, 5.

Boston School Physicians' Association.—At the annual meeting of the Boston School Physicians' Association, held at the Quincy House on January 24, 1921, the following officers were reëlected: Dr. Francis P. Silva, President; Dr. Francis G. Barnum, Vice-President; Dr. Edward J. O'Brien, Secretary-Treasurer. Besides the above-named officers, the Executive Committee includes: Dr. Bradford Kent, Dr. Joseph A. Cogan, Dr. Edward J. Timmins, Dr. Solomon H. Rubin. Dr. Silva is assistant visiting physician at the Boston Consumptives' Hospital and instructor at the Tufts Medical School. He graduated from the Harvard Medical School in 1893.

◆

## Correspondence.

### NEW METHOD OF BABY IDENTIFICATION FOR MATERNITY HOSPITALS.

Boston, February 17, 1921.

*Mr. Editor:—*

I am enclosing a brief article which I have written on a new method of infant identification which is now being established at Saint Margaret's Hospital and the Forest Hills Hospital.

The method is simple and effective and working so well that I am sending you this brief outline hoping that it may prove of interest to readers of the Journal.

Yours very truly,
Herbert L. Johnson, M.D.

Recent articles in the daily press on the possibility of confusing infants in Maternity Hospitals brings to light a situation which has long been a source of concern to those upon whom the responsibility rests.

While it is perfectly obvious that safety is paramount in any new method instituted, simplicity and economy are also essential factors. The much advocated system of foot-print identification adequately meets the first of these qualifications but its cost of administration and complex method of procedure prohibit it to the average hospital.

A safe, simple, economical method which I have recently devised is now being established at St. Margaret's Hospital, Dorchester, and the Forest Hills Hospital, Forest Hills, Mass. The entire equipment consists of two sets of aluminum tags made in duplicate form and numbered from one on, consecutively, the limit being determined by the number of maternity beds in use. A small hand seal press, the necessary aluminum seals, and silk cord complete the outfit.

The *modus operandi* is as follows: Two tags, each stamped with the same number, the silk cord and seal are all boiled up in a separate package with the delivery kit. The nurse in charge of the delivery room removes this equipment from its sterile package at the proper time and seals one tag around the neck of the mother by means of silk cord, aluminum seal and hand press (mentioned above), being careful to see that the silk cord is so adjusted as to prevent the removal of the tag over the patient's head. In like manner, the other aluminum tag is sealed around the neck of the infant before it is removed from the delivery room. These tags remain on the patients until just prior to departure from the hospital, when the baby is finally placed in charge of its mother. The number assigned to the mother and baby is duly recorded beside their name in the maternity ward book. A linen tag on the basket in which the infant is kept bears the name of the mother, date of delivery, sex, number of baby, and full name of physician.

The time consumed in the complete operation of tagging according to this method is greatly in its favor when compared to other methods now in use. Its other advantages are as follows:

1. It is absolutely safe in that it is impossible to remove the tags from the necks of the mother and child if they are properly adjusted.

2. It is convenient because the baby and mother can be bathed completely without fear of destroying identification marks. At nursing periods number one baby is sure to go to number one mother, and so on. The mother herself is able to check up in this way (a mental effect not to be scoffed at).

3. It is simple in so far as the entire operation can be completed by a student nurse.

4. It is economical because the complete outfit with a set of duplicate tags, numbered one to one hundred, and one thousand aluminum seals can be purchased for approximately $18.00.

The economy, simplicity, and absolute reliability of this method recommend its general adoption.

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### A REJOINDER.

Chelsea, Mass., February 18, 1921.

*Mr. Editor:—*

Inasmuch as you have seen fit to publish a communication from one Dr. R. Guralnick recounting his experiences in search of diphtheria antitoxin in Chelsea and attributing his lack of success to some ulterior motive, presumably on the part of the Board of Health, I desire to state, if you will permit me, for the benefit of any "foreigners" contemplating an "invasion" of Chelsea, that diphtheria antitoxin can always be obtained at the office of the Board of Health, City Hall, from 8 a.m. to 4 p.m., except on Sundays and holidays, and at the Frost Hospital on Bellingham Street, at any hour of the day or night.

Very truly yours,
George S. Fenwick, *Chairman.*

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### SOCIETY NOTICE.

Hampshire District Medical Society.—The next regular meeting of the Hampshire District Medical Society will be held at the Northampton State Hospital, Northampton, on Wednesday, March 9, 1921, at 4.00 p.m. The business session will be devoted to the discussion of legislative matters now being considered in Boston. The speaker of the day will be Dr. Walter Timme of New York City, who will talk on "Diagnostic Criteria of Disturbances in the Internal Glandular System," with lantern slide demonstration. Dr. J. A. Houston will open the discussion. Dinner will be served at the Hospital at the conclusion of the meeting by courtesy of Dr. Houston. Any physician interested is invited to attend.

E. E. Thomas, *Secretary.*

# The Boston Medical and Surgical Journal

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## Original Articles.

### SOME OBSERVATIONS UPON THE RÔLE OF IMMUNITY IN TUBERCULOSIS.*

BY HENRY F. R. WATTS, M.D., BOSTON,

*Physician to Convalescent Home of Boston City Hospital; Instructor in Theory and Practice of Medicine, Tufts College Medical School.*

WHILE on active service with the Medical Corps of the Army during the late war, the writer was assigned to the Tuberculous Section of the Division of Internal Medicine. This inforced concentration upon tuberculosis, together with the opportunity of carrying on the work, under the supervision of Colonel George E. Bushnell, chief of the section, whose profound knowledge and boundless enthusiasm were an inspiration to every man in the section, had the effect of developing a renewed interest in the subject of tuberculosis.

When one thinks tuberculosis, one thinks in terms of immunity, and it is my intention to present in this paper some of the current views upon the rôle of immunity in tuberculosis.

It has long been known that the great majority of the human family acquires tuberculosis in some form at some time. "Every man has a little tuberculosis," is an old proverb, the truth of which seems to have been established by many and repeated observations. If this is true, why does not the majority of the human race die of tuberculosis? Of course the answer to this is that the majority of the race is protected by its immunity.

Immunity carries with it as a corollary, localization. Localization is always a sign of immunity. If a man cannot localize pus germs he dies of septicaemia. If he does localize them he has an abscess. If his immunity is of a high degree, he has no suppuration. If an individual has no immunity to the pneumococcus and becomes infected with that organism, he dies of pneumococcus septicaemia. It is a sign of a degree of immunity when pneumonia occurs.

If a guinea pig is given a large injection of tubercle bacilli he quickly dies of a generalized tuberculosis, because he has no immunity. This is primary tuberculosis. If, however, the pig is inoculated with a smaller number of the organisms, he does not die; but, on the contrary, he acquires a degree of immunity to the disease, and can be reinfected only with difficulty, depending upon the degree of his acquired immunity and the size of the dose of organisms administered.[1]

There is a natural immunity which varies in every species of animal, including man, and in the individual of each species, but in the case of tuberculosis it is not sufficiently strong to afford any material protection to good-sized doses of tubercle bacilli.

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* Read before the Dorchester Medical Club, Oct. 11, 1920.

It is well to remember that immunity is always relative and that complete immunity to any disease does not exist.

Immunity, as the term is used by the writer, in connection with tuberculosis, refers to an acquired resistance to the disease.

Localization being an indication of immunity, it follows that phthisis, or tuberculosis localized in the lungs, presupposes a certain degree of immunity, acquired immunity, which could only have been acquired by an initial or primary infection occurring at some remote time in the past.

The results of animal experimentation, and in the absence of human experimentation, observation of the course of the disease as it occurs spontaneously in man, have established the theory, now generally accepted, that phthisis is a late manifestation of tuberculosis acquired during childhood. Behring, Romer, Hamburger, and others, basing their opinions upon the results of animal experimentation, maintain that primary infection cannot result in phthisis. Either the primary infecting organisms are impounded in the lymphatic system where they remain indefinitely and so react upon the tissues of the body as to develop more or less immunity, or they are freely disseminated throughout the body, resulting in a general miliary tuberculosis which is fatal.

The ubiquity of the infecting agent, the tubercle bacillus, in civilized countries is an hypothesis which few will find difficulty in accepting. It is estimated, for instance, that the number of bacilli discharged daily in the sputum of an advanced consumptive equals the number of human beings of the globe.

There is undoubted evidence that the human body is exceedingly prone to tuberculous infection. "Every man has a little tuberculosis," and when these circumstances are considered, it does not seem surprising that one out of every eight in civilized countries succumbs to the disease, but rather that the seven escape.

Authorities are agreed that the new-born infant, even that of a tuberculous mother, is free from tuberculosis; is virgin soil, ready and waiting for the ubiquitous seed. In civilized countries the soil does not have to wait long for the seed. Few escape.

It may well be asked, how is it that we know that tuberculosis is so widespread in civilized man as to be practically universal. There are two chief sources of information: the tuberculin test and the result of autopsy. Clinical observation is also an important source of information.

When the human body becomes infected by the tubercle bacillus, it becomes sensitized to tuberculin and "reacts" to tuberculin, the degree of sensitization being somewhat related to the degree of resistance or immunity which the body has acquired. Those who have no immunity, as the new-born baby, and the advanced consumptive whose immunity has utterly failed and who is going rapidly to the bad, do not react to tuberculin, even in large doses.[2]

When Koch began studying the properties of tuberculin, our present day views upon the subject of immunity were undeveloped, and as a result of his observations, he arrived at the conclusion that all tuberculous subjects would react to a dose of ten milligrams or less. In his own case, he reacted to 25 mg., and he established this as the standard for the healthy man, saying, that tuberculous cases would react to 10 m.g., and non-tuberculous cases to 25 m.g. At a later date, however, it appeared that Koch himself had tuberculosis. The fact that he did not react until a dose of 25 m.g. was reached, was evidence that he had a high degree of immunity, not that he had no tuberculosis.

It is believed that every adult will react to tuberculin if it is given often enough and in sufficiently large dose.

A reaction to tuberculin is considered as absolute evidence that the subject has been infected with the tubercle bacillus, because humans who have not been thus infected, will take any quantity of tuberculin without reacting. Young infants have been given several grams without producing a reaction. When it is considered that a thousandth of a milligram often produces a reaction, the significance of the massive dose to the non-tuberculous infant without reaction, can be better appreciated.

A certain Austrian regiment was tested with tuberculin and 60% reacted positively. Most of these men were healthy at the time and remained healthy for years, the percentage of tuberculosis developing among them was not greater than the average in the general population of that region. The experiment aroused much interest at the time; but in the light of the present conception of the subject, the interest of it centers in the 40% who did not react. It is explained by a higher immunity in the 40%, and if they had received a large enough dose, they would also have reacted.

The facts concerning the reaction of children to tuberculin are based largely upon the observations of von Pirquet, who showed that about 90% of the children of Vienna who were under 14 years of age, reacted positively to the cutaneous test. It was thought that the 10% of negatives were non-tuberculous. Recalling Koch's observations upon his own reactivity, the question naturally arises: were the 10% of negatives non-tuberculous, or were they tuberculous with so high a degree of immunity as to preclude reaction to this test?

Of course it is no longer held that a positive tuberculin reaction indicates tuberculous disease. It really means a degree of immunity, and immunity, as we have seen, can be acquired only by previous tuberculous infection. A sharp distinction should be drawn between tuberculous infection and tuberculous disease.

Post-mortem findings have demonstrated the presence of tuberculosis in some form in a high percentage of all cases coming to autopsy. Observers have not all arrived at the same figures, variations possibly being more or less governed by the zeal of the pathologist in searching and recording. It is not difficult to imagine the possibility of minute and obsolete lesions escaping observation. It seems hardly necessary to present a detailed review of the data available in the literature of this phase of the subject.

Few, if any, civilized countries, especially those in large centres, escape tuberculous infection. It does not necessarily cause any sickness or other evidence of its presence than an altered reactivity to tuberculin. Every man who is brought under civilized conditions, has come in contact with the tubercle bacillus and has taken them unto himself as the magnet does the steel, and has thereby undergone a sort of vaccination. The man whose vaccination has been more or less of a failure is the one who develops tuberculosis.

Investigation has shown that the child at a very early age begins his vaccinating process. It has been observed that in a family of healthy children who become exposed to tuberculosis by a consumptive coming to live in the house, the children over four years were unaffected by the direct exposure, while those under that age suffered an impaired development and were less robust than the elder brothers and sisters. The inference was that those children who were over four years old had already undergone their vaccination and were immune, while the younger children were apparently hard-hit by the infection to which they were exposed and against which they were not yet sufficiently protected. However much or little this observation proves, the general belief now is that the child acquires his infection at a very early age, during the "dirty age," so called, when he is creeping on the floor and putting everything into his mouth; sucking toys carved by a consumptive German, maybe, painted by another consumptive, and wrapped by a third. A family history of tuberculosis means little but an undoubted opportunity for infection, but the absence of such a family history also means little. Every child has an abundant opportunity for infection. Children in healthy surroundings have a better chance of getting a small infection and better vaccination.

The baby who is exposed to the cough of a tuberculous mother or nurse is in danger of receiving a massive dose of organisms, larger than what might be called the normal immunizing dose, and dies of general tuberculosis; general, because there is not likely to be present the necessary immunity to bring about localization. Holt and others give instances of tuberculous infection of the wound from a tuberculous operator during ritual circumcision of the Jews. The infant promptly becomes sick with tuberculosis, miliary in character, which runs an acute, rapid and fatal course.

A word about sensitization: Calmette of Lille found that if an animal is given a single small injection of tubercle bacilli, it would develop a marked immunity; but if it were given a number of small injections at frequent intervals, it died more quickly than the unprotected animal, showing that reinfection in the period of sensitization, immediately after the primary infection, is a peculiarly deadly thing. Sensitization, however, is an early phenomenon after primary infection and may be disregarded in the adult consumptive and in those giving evidence of having established an immunity.

We have no means of measuring the size of the infecting dose of bacilli which, in the child, acts beneficially in developing immunity without developing disease. It is well established, however, that minute doses acquired during the dirty age do result in establishing an immunity, and that opportunities for the acquisition of a greater degree of infection during that period may result in generalized tuberculosis.

Bushnell holds that, once tuberculous, always tuberculous; that once living tubercle bacilli gain entrance to the body, they or their progeny remain in the body in a living state, and so promote and maintain immunity. If the tuberculous subject were capable of entirely curing and eradicating his tuberculosis, he would, by gaining freedom from his tuberculous infection, lose his immunity, and thus render himself susceptible to a new infection which might conceivably be worse than the first.[3]

A vast deal of work has been done in an endeavor to determine the channel of entry into the body of the infecting agent. Popular belief based upon popular exploitation of the subject, disposes of the question with very little difficulty; if the infecting agent is human tuberculosis, it is inhaled; if bovine, it is ingested. Experimentation has shown that there are three channels of entry: the respiratory tract, the alimentary tract, and by inoculation into the skin and mucous membrane. There is no agreement among authorities as to the most common channel, and the evidence in literature covering the point is very voluminous. It seems doubtful, however, if tubercle bacilli ever reach the alveoli of the lungs by the air route, except under most extraordinary conditions, and if they do there is good evidence to show that the tubercle does not primarily develop at this point. The primary infection, if localized, is likely to be confined to the lymphatics. This has been demonstrated by necropsies of children in whom glandular involvement always occurs before the lungs are attacked, unless it be a generalized tuberculosis occurring before an immunity has been developed. In adults, with phthisis, the bronchial and mediastinal glands always show evidences of a very early involvement. These glands may have been infected primarily by an invasion by any one of the three channels mentioned.

Phthisis is an outgrowth of the primary glandular focus and again (at the risk of being tiresome) it must be stated that phthisis, or pulmonary tuberculosis, is a localization of tuberculosis and, as such, is an expression of immunity.

Miliary tuberculosis, on the other hand, is the antithesis of phthisis and occurs only in the absence of immunity; either before an immunity has been acquired or after it has completely broken down. It is common to see at autopsy of cases dying of phthisis (and in the army we autopsied every case that died) fresh miliary tubercles in the lungs, liver, spleen and kidneys, indicating a fresh miliary tuberculosis. This does not mean that the patient died of miliary tuberculosis, but that his immunity had gone and that he developed his miliary tuberculosis for the same reason that he died.

It was formerly held by pathologists that the presence of tubercle bacilli in the blood stream was evidence that the patient was in the greatest danger of developing generalized tuberculosis. Long experience, however, has shown that it is not at all unusual to find tubercle bacilli circulating in the blood of individuals who have not and do not develop very severe tuberculosis. This is accounted for by the patient's immunity.

At the present state of our knowledge, the following conclusions of Romer seem to be justified; they at least, enjoy a general acceptance among present-day students of the subject: Tuberculous infections occurring during childhood, so long as they are not acute and fatal immediately, endow the organism with a heightened resistance against renewed infection with tubercle bacilli. Immunity thus produced is, as a rule, sufficient to protect the person against exogenic infection during after years. When, however, extraordinary physiological or pathological conditions permit the bacilli, harbored within the body, to proliferate because of the inadequacy of the failing immunity, which becomes incapable of preventing metastatic reinfection, new tuberculous foci are formed, and again, or perhaps for the first time, clinical phenomena of disease make their appearance.

Experience shows that the metastatic reinfections mostly occur in individuals who were subject to massive infections during childhood. Therefore, "phthisis is but the last verse of the song, the first verse of which was crooned to the infant in the cradle."

The enthusiasts are strong for the theory that exogenic infection of the adult in civilized countries does not and cannot occur and that the average adult who must have acquired his immunity in childhood, or he could not have attained to adult life in the presence of the ubiquitous infecting agent, has nothing to fear from contact infection, even should he eat tubercle-laden sputum.

There is much evidence in support of the holdings of these enthusiasts and we look to experience in sanatoria and other congregating places of consumptives for data. Thousands of men and women engaged in a sanatorium work, as doctors, nurses, orderlies, and others, do not show a higher incidence of the disease than do persons of other occupations, yet the opportunities for infection of the susceptible are abundantly present. If guinea pigs, caged, are kept in a scrupulously clean tuberculosis ward, they promptly contract tuberculosis.[4] The consorts of married consumptives do not develop the disease in greater proportion than occurs among others of like social stratum.[5]

For many years before the tubercle bacillus was discovered, and consequently before any ideas as to prevention of infection were in general force, the little town of Lippspringe, in Germany, has been a mecca for consumptives. In 1820, its permanent population was 1,100. In 1909, it was 3,473. During this time, thousands upon thousands of open cases of tuberculosis have congregated at this place for the cure. The peculiar development of the resort did not, at first, lead to the building of large hotels and sanatoria, but the permanent population received the visiting consumptives into their homes, and for the most part, the family attended to the housework and did the nursing. Few domestic servants and, of course, no nurses, were in requisition. The population of the place has been very stable, few emigrated, and there were few new comers. The hygiene of the homes and of the town must have been medieval. For the decision of the question as to the danger of contact infection, it may be affirmed that at no time and no where in the world has a natural experiment of such extent and such duration been made as here.[6]

From the circumstances set forth above, it follows with certainty that if the views which we were preaching not so very long ago were true, there would long since have been no permanent population of Lippspringe. What was the result? In the first two decades of the last century the annual average deaths from tuberculosis was 10 per 1,000 population. In the decade from 1875 to 1885 it was 8 per 1,000. In the following decade it was 7 per 1,000.

Bushnell, together with others, says that transmission of pulmonary tuberculosis, at least to adults, through transient association with that disease, does not exist and never has existed.[7]

It is well known that aboriginal peoples have no tuberculosis in their native habitats and so do not acquire the childhood immunity infection. When these people come under the influence of civilized conditions, their mortality from tuberculosis is proverbial and the character of their disease is apt to be of the acute and rapid type.

The further one goes from civilization, the more rare is tuberculosis and at the same time the more virulent it is when it occurs. Per contra, where tuberculosis abounds, the less severe, on an average, are the individual cases, which is another way of saying: where tuberculosis abounds the more opportunity there is for acquiring an early immunity.

In view of all the facts, figures and opinions, as above set forth, it would seem to be in order to inquire as to the results of the anti-tuberculosis campaign which we have been waging in recent years. There has been an undoubted decrease in the occurrence of the disease in many of our cities and elsewhere, but the decrease has not kept pace with the decrease in the general mortality.[8] Moreover, the decrease, where it has occurred, began to take place before we began our campaign. It must be confessed that the results of the campaign have been somewhat disappointing to those most active in the movement.

An analysis of available data shows that there is a striking correlation in time between urbanization and the progress of industrialism, and the death rates from phthisis. Wherever urbanization is new, wherever modern industries have been recently developed, the death rate has been rising. This is true in Japan, Norway, Ireland, Serbia, and elsewhere. Ireland, for instance, as a whole, shows a gradual rise from 1870 to 1895, while Belfast, long an industrial centre, has shown a steady decline from 1885 to 1910.

Wherever industrial conditions have obtained for several generations, the death rate has been declining. In England, where the decline has been more pronounced than in any other country, the decline began to take place in 1833 and has continued ever since.[9] The beginning of the nineteenth century was the period of England's industrial development, and here the decrease in the death rate from phthisis has been contemporaneous with the adaptation of a people to urban life.

There are so many factors entering into this complex problem, which still remain obscure, it is difficult to arrive at satisfactory conclusions. It would seem that recent improvements in the social and hygienic conditions of the working classes, who constitute the majority of the candidates for the disease, must be a factor in future, if not in present tuberculosis morbidity and mortality. But the adaptation of people to city life and to the tubercle bacillus, is perhaps of greater importance than all other factors taken together, in bringing about the mortality reduction which has occurred.

REFERENCES.

[1] Bushnell, Col. G. E.: The Military Surgeon, Vol. xlii, p. 625, 1918.
[2] Fishberg: Pulmonary Tuberculosis, p. 319.
[3] Bushnell, Col. G. E.: Unpublished Lecture given at U. S. A. General Hospital 16, Aug. 1, 1918.
[4] Fishberg: Pulmonary Tuberculosis, p. 109.
[5] *Ibid.*: p. 110.
[6] Bushnell, Col. G. E.: Epidemiology of Tuberculosis, p. 124.
[7] *Ibid.*: p. 128.
[8] White, W. C.: Trans. Nat. Assn. Study and Prevention of Tuberculosis, 1913, ix, 80.
[9] Pearson, Karl: The Fight Against Tuberculosis and the Death Rate from Phthisis, London, 1911, p. 9.

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# THE SCHICK TEST AND IMMUNIZATION WITH DIPHTHERIA TOXIN-ANTITOXIN

By Benjamin White, Ph.D., Boston,

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The prevention of diphtheria, and even its eradication among the permanent population of the Commonwealth of Massachusetts, is possible of accomplishment. We now have at our disposal, in addition to the established antitoxin treatment, not only a reliable method for determining the susceptibility of human beings to diphtheria, but also a simple and safe procedure for rendering susceptible individuals immune to this disease.

Diphtheria, in 1919, was responsible for 14.9 deaths per 100,000 population, or a total of 591 deaths out of 7,928 reported cases in this State. It is reasonable to assume that all cases were not reported. In addition to the toll of 591 lives we suffer great economic loss, anxiety, and time entailed in the sickness and treatment of 8,000 persons. Moreover, diphtheria is essentially a disease of childhood, and the State is yearly deprived not only of approximately 600 prospective citizens, but also of their possible contribution as potential parents.

We still have an incidence of about 8,000 cases and a mortality of approximately 8 per cent. of all reported cases in spite of the complete efficacy of antitoxin treatment when promptly and properly applied. Antitoxin, when given in sufficient amounts on the first day of the disease, in cases without serious complications, effects 100 per cent. of recoveries. With the possession of such an efficient means of treatment, it would be difficult to understand why we continue to have deaths from diphtheria were it not for the astonishing facts revealed in Carey's investigation of the circumstances attending 1,000 deaths from this disease. He found that "31.5 per cent. of these deaths occurred in individuals who had been sick one week or more without medical attention; 11.8 per cent. occurred in individuals who were moribund at the doctor's first visit; 7.6 per cent. occurred in individuals in whom the condition was unrecognized until it was too late for the antitoxin to be efficacious, and 65 per cent. of these deaths occurred in children who were 5 years or under."

The causes for the prevalence of diphtheria with its stationary death rate are:

1. The presence of susceptible individuals in every community and failure to detect and immunize them.

2. The existence of healthy human carriers of virulent diphtheria bacilli.

3. The neglect of parents or other temporary or permanent guardians to procure medical attention for children in the early stages of the disease.

4. The failure to report some cases of diphtheria.

5. The failure to diagnose diphtheria in its early stages.

6. The failure of some physicians (a) to administer antitoxin in suspicious cases before making a definite diagnosis; (b) to avail themselves of the diagnostic facilities offered by the

State and various cities; and (c) to administer antitoxin early enough or in sufficient amount, or (d) to administer antitoxin intravenously in late or severe cases.

It must be apparent that by detecting all susceptible persons in every community and rendering them immune to diphtheria the other causes for the present continued morbidity and mortality from this disease would eventually cease to operate.

### I. THE PRESENCE AND DETECTION OF PERSONS SUSCEPTIBLE TO DIPHTHERIA INFECTION.

As a result of the work of Schick, we know that individuals who possess less than one-thirtieth unit of diphtheria antitoxin in one cubic centimeter of their blood may, and frequently do, contract diphtheria if exposed, while those possessing this or a larger amount of antitoxin rarely, if ever, develop clinical diphtheria. The earlier methods for determining the antitoxin content of the blood were far too intricate to permit of their clinical application. In 1913, however, Schick described a simple test for this determination. Following the introduction of this method, Park, Zingher, and others carried out investigations on the susceptibility or immunity of various age groups, and the figures recently published by Park may be taken as indicating the percentage of individuals liable to contract diphtheria.

Susceptibility of Various Ages to Diphtheria.

| Age | Susceptible |
|---|---|
| Under 3 months | 15% |
| 3 to 6 months | 30% |
| 6 months to 1 year | 60% |
| 1 to 2 years | 70% |
| 2 to 3 years | 60% |
| 3 to 5 years | 40% |
| 5 to 10 years | 30% |
| 10 to 20 years | 20% |
| Over 20 years | 12% |

From this table it is apparent that the majority (85 per cent.) of infants under three months of age are immune to diphtheria and that the percentage is practically the same as in adults. This may be explained by the theory that babies are born with a passive immunity acquired from the mother through the placental circulation. But this immunity disappears to a considerable extent with the succeeding months, resulting in the susceptibility of about 70 per cent. of all children between one year and two years of age. The age of greatest susceptibility is from six months to five years, which corresponds closely to the age groups in which the most dangerous laryngeal forms of diphtheria and complicating bronchopneumonias occur. As the age increases, the proportion of susceptibles decreases, which also squares with the lower incidence of diphtheria in the higher age groups.

1. *Theory of the Schick Test.* Diphtheria toxin causes an inflammatory action when injected into susceptible tissues. This reaction does not occur if the toxin is neutralized with its antitoxin before injection, or if an adequate amount of antitoxin is already present in the blood of the individual. Schick found that an antitoxic content of one-thirtieth unit per cubic centimeter of blood is ample, not only to render one immune to infection, but also to neutralize and prevent the inflammatory action of a small amount of toxin injected into the skin. Upon this phenomenon is based the Schick test. A positive reaction means susceptibility, a negative reaction shows immunity. Those who show a positive reaction may and do contract the disease; those who show a negative reaction may become carriers of virulent diphtheria bacilli, but do not develop clinical diphtheria.

2. *Technic of the Schick Test.* The test is carried out by injecting intracutaneously one-fiftieth of a minimum lethal dose (M. L. D.) for a guinea pig weighing 250 grams. The State Department of Public Health supplies free an outfit, which contains sufficient titrated diphtheria toxin with the proper amount of sterile salt solution for fifty tests. The toxin is contained in a capillary tube, and when it is desired to perform the test the contents of the tube are expelled into the bottle containing the salt solution. One-tenth of a cubic centimeter of this mixture represents the dose to be injected into the skin and contains one-fiftieth M. L. D. of toxin. This diluted toxin must be used within a few hours after mixing, because it rapidly loses its potency when exposed to light and room temperature. The skin on the flexor surface of the arm, preferably above the elbow, is cleansed with alcohol, acetone or ether, and one-tenth cubic centimeter of the diluted toxin is injected *into* the epidermal layers of the skin. This is best accomplished by means of a short but sharp-pointed No. 26 or 27 gauge hypodermic needle. The 1 c.c. "Record," or other tuberculin syringe, is well adapted for the purpose. If the

point of the needle has been properly inserted with the lumen uppermost and visible through the skin, the injection should produce a small, slightly raised, white area, or wheal, which should move with the skin and disappear in about one-half hour. The injection should never be made *under* the skin. The technic of the test is easily acquired. The injection causes little or no pain, it is never followed by constitutional symptoms, and the site of injection requires no subsequent care.

3. *The Positive Reaction.* A positive reaction begins to appear in 24 to 36 hours and is characterized by a circumscribed area of redness and slight infiltration which measures one to two centimeters in diameter. It develops gradually, reaches its greatest intensity on or about the fourth day, then fades very slowly, leaving a scaly, brownish pigmented spot. The positive result of the test represents the true irritant action of diphtheria toxin, and signifies that the individual possesses little or no antitoxin in the blood, and therefore may contract the disease.

4. *The Negative Reaction.* The native diphtheria antitoxin in the tissues of an immune person neutralizes the injected diphtheria toxin, and on the day following the injection no signs are present except the slight and fleeting mark incident to the insertion of the needle.

5. *The Pseudo-Reaction.* In some individuals, particularly in adults, a reaction develops which may be confused with a positive reaction. Owing to the hypersensitiveness of some persons to the protein of the diphtheria bacillus present in the toxin, a local reaction may appear at the point of injection. The pseudoreaction is distinguished from the positive reaction by its more rapid development. "It appears usually within twelve to eighteen hours, and fades in about three to four days, leaving only an irregular area of brownish pigmentation and generally shows no scaling. In appearance the moderate pseudoreactions, at the end of twenty-four hours, resemble very much the fully developed positive reactions, while the marked pseudoreactions show a considerable amount of infiltration with a central darker reddish area, surrounded by a fainter areola, which shades off into the surrounding skin" (Zingher). In order to exclude pseudoreactions, repeated observations over a period of five or more days should be made and the appearance carefully noted. "By this time the pseudoreaction will have faded and can be recognized by a blotchy area of pigmentation, while the true positive reaction will be at its height. The positive reaction will show at this time a definite circumscribed area of scaling redness, which gradually develops a brownish pigmentation. Those tests, however, which show only an area of bluish discoloration, or faded irregular areas of brownish pigmentation which do not scale, are generally the remains of pseudoreactions" (Zingher).

A control test should be performed on the other arm, injecting one-tenth cubic centimeter of a similar dilution of toxin which has been heated to 75° C. for five minutes. "By heating the toxin broth at this temperature the soluble toxin is destroyed, while the autolyzed protein of the diphtheria bacillus, which causes the pseudoreactions, is not appreciably affected. The control test with the heated toxin will reveal the pseudoreaction and combined reactions. Observations must be made at the end of seventy-two or ninety-six hours. The twenty-four-hour reading will give fairly accurate results in about 95 per cent. of the tests, when the control test with heated toxin has also been made. If negative, both the test and control will be normal. If a pseudoreaction is present, both the test and the control will show areas of redness and infiltration, which are similar in size and appearance; both reactions will fade at the end of seventy-two hours and leave only a small, irregular area of pigmentation, and generally no scaling. The pseudoreaction varies in intensity in different individuals from an area of circumscribed redness without infiltration to a reaction which shows a considerable degree of redness and infiltration, and a more or less characteristic clinical appearance."

6. *The Combined Reaction.* "If a combined reaction is present, the redness and infiltration at the site of the Schick test will be more marked at the end of twenty-four hours than in the control test. At seventy-two hours, the positive reaction will be quite distinct, while the control test will show only a blotchy area of pigmentation representing the pseudoreaction elements of the test. If the test is positive, the reaction at the end of twenty-four and seventy-two hours will be positive only at the site of the Schick test. The negative and the pseudo

reactions indicate immunity, the positive and the combined reactions, susceptibility of diphtheria'' (Zingher). The appearance of pseudoreactions presents no especial difficulties. A short experience in reading the reactions will suffice to enable one to make a correct interpretation of the results.

7. *Importance of the Schick Test.* The importance of this test cannot be too strongly emphasized. The information which it yields as to the susceptibility of an individual enables us to apply a method for transforming susceptibility into immunity, thus protecting that person against a possible attack of diphtheria.

The immunity possessed by persons giving a negative Schick reaction obviates the necessity of administering antitoxin to them even though they are exposed to infection. Park states, ''It seems safe to rely on the belief that a person with a sufficient amount of antitoxin to give a negative Schick test is incapable of developing constitutional toxaemia, or a severe infection from diphtheria bacilli. There is a doubt as to whether very slight infections of the superficial mucous membrane may occur in such persons. My own opinion is that cases supposed to be of this character are instances of streptococcus infection, the diphtheria bacilli being present as in a carrier. Those that show a faintly positive Schick test are probably liable to moderate local infection.''

The reliability of a negative test as a true indicator of the immunity possessed is convincingly attested by the observation of Park that in spite of the fact that 24 per cent. of all children showing a negative Schick reaction were found to be carriers of virulent diphtheria bacilli, none developed diphtheria, and, furthermore, he has never seen a case of clinical diphtheria develop in a person reacting negatively to the Schick test.

The saving of time and inconvenience and of the expense for antitoxin effected by omitting the prophylactic injection of antitoxin in immune persons is a matter of no small moment among the general population as well as in institutional practice.

## II. ACTIVE IMMUNIZATION AGAINST DIPHTHERIA.

In many communicable diseases the greatest and most lasting immunity is that conferred by an attack of the disease, while a transient passive immunity is that produced by antitoxic and other immune serums. When exposure to infection is recent, immediate, or likely to occur within a few days, the prophylactic injection of diphtheria antitoxin is by far the most efficient means for warding off an attack of the disease. It should be borne in mind, however, that the protection afforded by an immunizing dose of antitoxin can be depended upon for a period of only two to four weeks. In the past decade there has been developed a method of producing active immunity in human beings, which is far more lasting, although it requires a considerably longer time to develop, than that produced by antitoxin. The injection of diphtheria toxin partially neutralized with its antitoxin—and, therefore, harmless—stimulates the production of sufficient native antitoxin in the body to cause persons previously reacting positively to the Schick test to react negatively, and to render them immune to an attack of diphtheria.

The development of active immunization by means of toxin-antitoxin mixtures constitutes one of the most notable contributions of medical science to the welfare of mankind. The possibilities of its univeral adoption and application must be apparent when it is realized that by such a means it would be possible to immunize all susceptible persons to diphtheria, thereby preventing the clinical disease. The complete harmlessness of the procedure, and the efficacy of the protection it affords for a period of at least four and a half years have been firmly established by the results of Park's experience in 15,000 immunizations.

1. *The Toxin-Antitoxin Mixture.* The rationale of immunization with diphtheria toxin-antitoxin consists in the production of an active immunity by the injection of small amounts of diphtheria toxin so neutralized with its antitoxin as to be devoid of any harmful or undesirable action. Potent diphtheria toxin is aged until its strength becomes constant, its potency is then accurately determined, and to 86-100 per cent. of the L+ dose (L+ dose equals the amount of toxin required to kill a 250 gram guinea pig in four days, when mixed with one unit of antitoxin) is added one unit of antitoxin. The mixture is so prepared that the dose used, usually one cubic centimeter, contains three L+ doses of toxin with three to three and one-half units of antitoxin. The mixture is subjected to the most rigid bacteri-

ological tests for sterility, and its harmlessness for human beings is determined by animal tests. Guinea pigs receive one and five human doses, respectively and must survive five weeks before the mixture is finally released for distribution.

2. *Dosage.* The toxin-antitoxin mixture as supplied by the State Department of Public Health is prepared in strict accordance with the requirements of the United States Public Health Service. The course of immunization consists of three injections of 1 c.c., each given at intervals of seven to ten days. The injections of the undiluted mixture are made subcutaneously, preferably over the insertion of the deltoid. For children under six months of age, the dose is 0.5 c.c., and three injections are given at seven-day intervals.

3. *Reactions.* A local inflammatory reaction characterized by moderate swelling and some redness and tenderness, may develop at the site of the injection in adults, but this rapidly subsides and causes no inconvenience. At times, in adults, a slight constitutional reaction consisting of slight fever and some malaise may be caused by the injection. This reaction may be due to hypersensitiveness to protein of the diphtheria bacillus, or it may possibly be caused by pepton in the toxin. This allergic condition exists in many adults, but is rarely found in young children. In the latter, accordingly, reactions seldom occur. Park reports that in his large number of immunizations no serious effects have appeared.

4. *Appearance of Immunity.* The immunity produced in response to this method of immunization develops slowly, it may require a period of eight to twelve weeks for a sufficient amount of antitoxin to develop to inhibit the Schick test. Each individual so immunized should be given a Schick test three months after the last injection. The failure of a person to react to the Schick test shows that sufficient antitoxin is present in the body to render that person immune to diphtheria.

5. *Duration.* The use of toxin-antitoxin mixtures is of such comparatively recent introduction that it is impossible at present to determine the full duration of the protection which it confers. From Park's observations it is definitely established that the immunity persists for four and a half years at least, which is the period over which his studies have continued. It is likely that it exists for life; but, be that as it may, the fact that complete protection continues for over four years, makes it possible by applying this procedure to infants to insure children against infection during what would otherwise be the most susceptible period of their lives.

6. *Influence on Reactivity to Schick Test.* When the full course of three injections is given it will be found that within three months after the last injection over 90 per cent. of all individuals previously giving a positive Schick test will give a negative reaction, and that this number will have acquired an active immunity to diphtheria. The remainder should be immunized by repeating the course of injections.

7. *Influence of Antitoxin Injections on Production of Immunity by Toxin-Antitoxin Injections.* It has been found by Zingher that recent administration of diphtheria antitoxin interferes with and retards the development of immunity following the injection of diphtheria toxin-antitoxin mixtures. Whenever, therefore, the course of injections is given to an individual who has recently received diphtheria antitoxin, retests with the Schick reaction should be performed at the end of ten or twelve weeks after the last injection of toxin-antitoxin.

Under no circumstances should the mere fact that a person has received the usual course of diphtheria toxin-antitoxin be relied upon as proof that complete protection against diphtheria has been produced. All immunizations should be controlled by subsequent Schick tests, and all persons reacting positively to the test should be given a second course of injections of toxin-antitoxin.

### III. GENERAL CONSIDERATIONS AND RECOMMENDATIONS.

1. All persons over 18 months of age in the entire community should have their susceptibility to diphtheria determined by means of the Schick test, and the reaction which they show should be noted either in institutional records or in the records of the family physician.

2. In infants below 18 months of age the Schick test is not necessary because a negative reaction may give rise to a false sense of security. Very young infants may exhibit a negative Schick test owing to the immunity passively acquired from the mother, but, inasmuch as this type of immunity is transient, it is safer to as-

sume that no child under 18 months possesses permanent immunity.

3. All infants below 18 months of age accordingly should be actively immunized with three doses of 1.0 c.c. of diphtheria toxin-antitoxin mixture, irrespective of the reaction to the Schick test which the infants might show at the time of immunization. The doses should be 0.5 c.c. for babies under six months of age and 1 c.c. for all others.

4. All persons over 18 months of age who give a positive Schick test should be immunized by receiving three subcutaneous injections of 1 c.c. each of toxin-antitoxin at intervals of seven days.

5. All persons immunized by this method should be retested three months after the last injection, and re-immunized if they should by any chance still give a positive Schick reaction.

The medical profession now possesses in the Schick test a simple and reliable means for ascertaining the susceptibility or immunity of an individual to diphtheria; in diphtheria toxin-antitoxin, a safe and sure method for rendering all susceptibles immune; and in diphtheria antitoxin, an effective means for treating the disease. The State, through the Department of Public Health, offers to the physicians of the Commonwealth the biologic agents required both for the Schick test and for active immunization; every facility for the rapid diagnosis of suspected cases; the service of epidemiologists and district health officers to discover foci and to trace the course of infection; and offers a free and abundant supply of potent diphtheria antitoxin. It would seem, therefore, that with these facilities at our disposal, and with the active coöperation and participation of the medical profession in their use and application, children could be permanently spared from this scourge. The only cases of diphtheria occurring in the Commonwealth would be among those individuals who came from without the boundaries of the State, or those who have failed to receive or avail themselves of the means of protection freely offered to them.

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Honor for Dr. Jelliffe.—Dr. Smith Ely Jelliffe of New York has been made an honorary member of the Societé de Médicine Mentale de Belgigue at its recent reunion.

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# INTERNAL DRAINAGE OF ACUTE EARS, AND ABORTION OF ACUTE MASTOIDITIS BY THE USE OF SIR A. E WRIGHT'S SOLUTION.*

By George A. Leland, A.M., M.D., F.A.C.S., Boston.

Drainage of the middle ear is furnished by Nature through the Eustachian tube. This tube is not an open pipe, but merely a slit in the side of the naso-pharynx leading up to the bony isthmus, the posterior and superior walls of which are formed by cartilage, and inferior and anterior by soft fibrous (fascia) tissue. In hardened specimens at the top there appears to be a small opening which may be the lumen of a very small part of the structure which, in normal conditions may be more or less open. In very early life, the direction of the Eustachian tube is nearly horizontal, assuming a more and more oblique downward direction as life advances. Now the tube is not simply a pipe to allow the passage of fluids either way, but is lined with mucous membrane whose surface cells are ciliated, the direction of whose constant motion is towards the pharynx.

Moreover, the position of the tube and the downward moving ciliae are not the only factors which assist drainage from the middle ear. The tensor palati, which might be called the dilator of the tube as it is continuous with Rudinger's dilator tubae has its attachment to the anterior lip of the Eustachian cartilage and the fascia of the anterior wall, and by its action pulls the whole anterior wall of the tube forward; and the levator palati is attached inferiorly to a part of the lateral plate and to the membranous part of the floor of the tube. By their contractions, these muscles exert a pumping action on the pharyngeal end of the tube with every movement of the velum, as in talking, swallowing, etc. This is very prettily shown by the late Dr. Holmes' naso-pharyngoscope. Through this little instrument may be seen the forward pull of the anterior wall of the Eustachian tube and also a bulge under the mouth, so as to wedge it open. This swelling is described (Quain) as the belly of the levator of the palate. At all events, this pumping action is very well seen to open the tube by the tensor palati and the bulging belly of the levator to push the anterior wall forward and the posterior harder wall somewhat backward. And it may also be seen that if the inner part of the mouth (pharyngeal orifice) is obscured by thickened membrane or if it is covered by translucent adenoidal tissue or if the fossa of Rosenmueller is narrowed or obliterated by adhesions or adenoidal masses, this pumping action is much curtailed or abolished.

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* Read at the fifty-third annual meeting of the American Otological Society, May 31 and June 1, 1920, Boston, Mass.

It is probably true that 95—99% of acute middle ears have their origin in inflammatory conditions of the naso-pharynx, the consequent swelling blocking the Eustachian mouths. I have laid myself open to criticism by saying that, except from trauma, 100% of the children under 12 years of age, with acute ears, have adenoids. By this I do not mean masses of adenoids sufficient to block respiration, but sufficient to diminish or inhibit drainage and ventilation through the Eustachian tubes; and by this is meant sufficient adenoids to prevent this pumping action and to hinder free exit to whatever the ciliated epithelia may bring down.

Hence, as Nature has supplied this mechanism for this purpose, it has long seemed rational to reëstablish these functions when by inflammatory thickening, infection or simply, by hyperemia they are held in abeyance.

Some years ago, in an A. M. A. meeting, a reader,* or speaker, mentioned that Leland did not hesitate to operate on adenoids in acute conditions. For years, it has seemed to me that this is just the right time to operate, especially for acute conditions involving the middle ear, for then the great desideratum is drainage, *cito, tuto, et jucunde.* It may be readily seen that a quick restoration of the above mentioned functions is the best way to bring about drainage; and it especially recommends itself because there is then no way for infection from without, as in the classic operation of paracentesis, after which an acute case frequently requires attention from one to six weeks, with danger of the middle ear becoming purulent, and of infection of the external canal resulting in furunculosis.

This method is simply to clear the region around the Eustachian tube in front and below, but especially in the fossa of Rosenmueller. This evidently cannot be done with any form of a naso-pharyngeal guillotine, because that instrument does not reach the fossae; but must be done with a naso-pharyngeal curette of almost any form, or with the sharpened sterile and alcohol-hardened finger-nail. In using the curette, the contour of the spinal column should be borne in mind, and then with the shank of the instrument in the same side of the mouth, with an outward twist and downward sweep, the posterior wall of the fossa is readily and smoothly cleared: the finger-nail may then be used to finish up (the tactus eruditus). This procedure is usually followed up by a little belladonna or atropia to diminish circulation in the throat. Usually, when the earache is thus treated early, within the first 24—48 hours, the inflammation in the tympanum immediately subsides. But even after three or four days, if rupture of the membrana tympani has not taken place, drainage begins, bulging subsides, and soon the hyperaemia disappears.

With all these acute attacks, it is probable that there is more or less effusion into the tympanum. Hence, after the redness has disappeared, say after five days, it is good practice to blow the drumhead away from the inner wall to prevent adhesions. This may be necessary but a few times for it is probable that the drumhead soon assumes its normal position, because air finds its way into the drum cavity. After five days or so, it may also assist to make a few applications of an organic silver disinfecting and astringent solution to the sides of the naso-pharynx, especially into the wounded fossae, lest adhesions again diminish their width and depth.

Brief mention of a few cases may point this moral, if they do not adorn the tale:

About seven years ago, on a Tuesday, a child of about three years of age, her face suffused with an acute cold, was being hurried away from the clinic. The mother said she had cried with earache two or three nights. Both drumheads were red and markedly bulging. Over a cuspidor, two rooms away from the mother, vociferous lachrymation and futile resistance being at this age a good analgesic, with the sharpened and cleansed finger-nail, the naso-pharynx and especially the lateral recesses were relieved of masses of soft adenoids, accompanied by much hemorrhage—a good derivative—which soon ceased. Two days later, there was no bulging and there has been no more pain complained of; slept well. Two days later, the redness had almost disappeared and the child appeared to the mother about normal. In this case the duration of the earache before treatment had been longer than desirable.

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* The Relation of the Rhinopharynx to the Middle Ear and Mastoid. By E. L. Jones, M.D., Cumberland, Md., Jour. A. M. A., Jan. 9, 1915. Vol. lxiv, pp. 115-117.

On November 26, 1913, about 7 P.M., I learned from a pediatrician, that a child was in need of a specialist, for acute ears. I found a child of seven months, both drumheads bulging, on one of which was a considerable bleb. The child, of course, had taken cold; had not slept much the night before, peevish all day, without appetite; in fact, had refused food. I told the doctor that I did not wish to incise the drumheads, as that probably would mean more or less attendance afterwards; but I preferred to get internal drainage. He said he did not know what that meant, but what I wished to do he would sanction. We therefore enveloped the child in a blanket and sheet and, without anesthesia, with Vogel's small curette, the nasopharynx, and especially the fossae, were freed from a small amount of adenoidal tissue. It was impossible to get my finger up behind the palate. I therefore used the curette to scrape and roughen the surface as much as possible. Hemorrhage slight. Prescribed a slight amount of belladonna to be given when awake through the night. I asked the doctor to make his visit in the morning and to call me if he found things not satisfactory. He found the child sitting on her mother's knee, crying for a second bottle; had been a little restless the early part of the night, but had slept pretty well; no sign of inflammation in either ear. The bleb had broken, but the drumheads were in good position and color; there was no injection to be seen. He expressed astonishment at the condition of the child. I took the precaution to examine her next day. Found the condition of the ears as if nothing had taken place. On the fifth day, I called to inflate the middle ears and found her out-of-doors in her carriage, a blustering December day. I also visited the child next day and inflated the ears, and that was the end of the trouble—otitis media acuta, 24 hours standing; immediate restoration to the normal.

On January 30, 1916, a gentleman in a neighboring city said his family doctor wished to incise one of the drumheads of this little girl of about three years of age, but he preferred to have it done by a specialist. I found the right ear markedly bulging and reddened. This was the ear that was to be cut, and the other was just beginning; therefore if the right had been cut it would have been necessary in a few hours to perform the same service for the other. After a slight argument, the doctor who expressed ignorance of any such procedure, persuaded the father to allow the adenoid operation. This was done as usual with special reference to the region of the tubes behind and below. It was accomplished with a curette, and finger-nail. The doctor afterwards said there was no sign of inflammation the next day and the ears were inflated on the fifth day. I afterwards learned from the father that the family physician was doing the same thing to some of his patients with success.

On the seventh of April, 1915, a child 2½ years of age had complained of an earache two or three days. About the same conditions as above mentioned were found, and the same treatment was carried out. The subsidence of symptoms and restoration to normal conditions did not take place for about nine days and then inflation was necessary twice within a week. Since that time no trouble with the ear has taken place, and she has been remarkably free from colds.

These cases are not the only ones, of course, but are perhaps typical. Whenever an acute middle ear (and also ordinary catarrhal cases) come into my practice this is the treatment followed, if the parents and patients can only be persuaded to allow it.

Of course in the light of modern carelessness as to ears, which, happily, is gradually disappearing, this operation may seem too formidable to parents; therefore we sometimes meet with opposition. This procedure, moreover, while it has brilliant results in the acute cases, is also beneficial for conditions of the middle ears where a chronic process, catarrhal adhesive, or suppurative seems intractable. It is doubtless true there would be many less running ears and many less cases of catarrhal deafness if the restoration of the free Eustachian tube with an efficient pumping action of its muscles could be brought about.

Now, as to cases of abortion of mastoiditis, here drainage comes into play again, and it is time the profession woke up to the futility of trying to drain abscesses through a pinhole, as my colleague, Dr. Borden, has expressed it. It has been my practice for the last six or eight years to drain acute inflammatory conditions of the middle ear involving the mastoid, through multiple openings of the membrana tympani and the peripheral walls of the canal. Dr. George P. Sanborn, a pupil of Sir Almroth Wright and our best sero-therapeutist, introduced me to Wright's so-called "drawing" solution. Sir Almroth describes its action as making use of a decalcifying substance (sodium citrate) which stops coagulation of the blood, together with an hypertonic solution of salt, which induces rapid exosmosis. The solution consists of 1% of citrate of soda and 4% salt (chloride of sodium).* An acute mastoid usually shows tenderness and redness and perhaps some swelling over the bone. In this case there is usually a much thickened and reddened drumhead and marked prolapse of the walls of the bony canal, especially superiorly and posteriorly. A small hole through the drumhead usually does very little good, therefore an incision should be made through the posterior segment of the drumhead curving upward and backward on the bony wall of the canal and cutting deep down to the bone. Three other deep incisions are made similarly through Shrapnell's membrane beginning at the posterior fold, upward and out on the canal; another at the anterior fold, another directly above the neck of the hammer. Of course the bleeding is profuse. Sometimes coagulation of the blood will stop sufficient drainage. In order to obviate this, the solution of citrate and salt is poured in warm immediately after the incisions, and with a pledget of cotton in forceps or with a cotton applicator is pumped down into depth of the canal and the bleeding encouraged and clots, if any, wiped away, until the solution is well applied to the incisions. A light gauze wick is then introduced, saturated with the solution, and a dry pad (or two) placed over the orifice. The pad is to be changed as often as wet, but not the wick in the canal. Usually the cotton pad is soaked every 15 miuntes in the next 24 to 48 hours, and it is often astonishing how much serum comes away. The next morning the wick in the canal is changed and the warm solution again poured in; and if the incisions have begun to close they are wiped with a cotton applicator to start bleeding again. This latter procedure I have found almost never necessary. Now this flux is not simply drainage, but we get the advantage of a tremendous welling outwards of a large amount of lymph with its more or less bactericidal action, which power increases as more and more fresh serum is drawn from the blood and washed through the infected region. At any rate inflammatory conditions are usually absent in the course of a day or two.

February 18, 1914. With a Chesterfieldian flourish, a physician of Jamaica Plain brought me a patient, saying, "Ah, Doctor, I have brought you a mastoid!" Man, 29 years old, large, florid, and well-fed; five weeks before, had a cold. Four weeks ago much pain in left. Paracentesis at a hospital two weeks ago. Five days before visit x-rays showed mastoid cloudy. Feverish and chilly up to two weeks ago. Treated by external heat, and whiskey. At visit, temperature 100. Pus in canal, drumhead red, thick, opaque, granulations and a pouting perforation upper posterior quadrant. Tenderness over antrum and posterior border of tip, no swelling nor redness over mastoid. Naso-pharynx treated with solution of silver nitrate 4%; and Rhinitis full strength every hour till dry throat. Nose much engorged, with marked deflection of septum to left. 19th —No pain since yesterday; tenderness over antrum but not at tip. Took rhinitis tablet triturates too few. Two days later, 21st—Pain began at noon on 20th and lasted till 6 A.M. today; tenderness and slight oedema on mastoid. Membrana tympani thick, red, bulging. Free paracentesis under local anesthesia. No pus, some blood, soaked in citrate of soda and salt solution. Bloody serum discharged all night Cotton pads changed often; much pain 9 P.M. to 1 A.M. At visit bloody wick removed, serous discharge. Soaked again with same solution; corrosive wick and cotton pads. No pain night of 22nd. Much discharge till 10 A.M. Tenderness nearly disappeared. On 25th, seven days after first visit, no pain for three days, no granulations, pouting perforation absent. Feels well. Two months later hearing about normal. This case, which had trouble four weeks with temperature, cleared up in about five days without mastoid operation, which seemed saitsfactory.

February 2, 1916, a suburban physician telephoned in he was sending me a mastoid case, and he wanted nothing to do with it. Rev. F. H. S., 39 years old, had grippy cold three days. General pain, malaise; yet preached three days before. On the 1st inst., 3 A.M., very severe pain in right ear; broke at 10 A.M. Copious bloody discharge since; at visit, 12 M., pain nearly gone. This A.M., considerable tenderness of mastoid. Holds head bent to right. No digastric pain. A.M.—temperature 99.8° Right

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* "The citrate of soda, by decalcifying the lymph, prevents coagulation and scabbing; and the salt, acting by osmosis, causes fluid to transude from the blood vessels. Under the influence of this application, a clear lymph wells out and the local conditions rapidly improve." Studies in Immunization, p. 355.

ear otitis media acuta with perforation, brown exudate on upper posterior wall; posterior wall and Shrapnell's membane prolapsed; granular surface under exudate. At 1.30, under ether, posterior segment incised, and Shrapnell's in three places, all out onto and through to bony wall of canal. Wright's solution pumped in, corrosive wick wet in this solution and gauze pad to auricle. R, Rhinitis one-half strength every hour. That night rather restless, very copious watery discharge. Evening temperature, 100.5; pulse, 96. Considerable tenderness of tip and hurt to open mouth (tenderness of inner surface of tip). Wick and solution pads renewed. February 4—Discharge less, pads changed less often. Tenderness of tip continued. Evening temperature 99.4; 5th, less swelling of membrana tympani and Shrapnells; less tender tip. Evening temperature, 97.4, 6th: better, less discharge, mastoid tip and di gastric tender. Posterior inferior quadrant slightly swelled; paracent. under local anesthesia, slight bloody flow, same solution used (citrate sodium and salt). Went to complete recovery and on the 28th, hearing normal. Membrana tympani shows scar in posterior segment and bright point of adhesion at anterior border of umbo.

It was, I think, McKernon who called attention to prolapse of superior and posterior walls in grippy conditions, after the great influenza epidemic of 1889 and 1890. This case, with that bony involvement and tender tip seemed bound for a mastoid, but subsided in five or six days.

August 3, 1916, F. S., boy, 10 years old, brought by mother from beach. Great swimmer. Night of 29th ult. (5 days before), much earache. Probably got sea water (dilute sewage) into nose and blew it, as is seen so commonly at bathing places, salt and fresh. Next two days treated at home with hot instillations and hot boric irrigations. Next day more comfortable. Today, languid, no appetite, less pain last night than at first. Head held stiffly to right. Temperature 100.3. No pain referred to mastoid. Drumhead bulging, red and thick, especially Shrapnell's and posterior segment. Anterior and posterior tip tender.

As an elder brother had had a mastoid operation 5½ years before parents were much afraid of having another. Hence under primary ether, usual four deep incisions were made. Citrate soda and salt solution pumped in many times as blood clotted very quickly. Few adenoids were stripped from sides of naso-pharynx with curette and finger-nail and grain ⅛ Belladonna extract given every hour. Pads changed frequently that night and next day, no pain, ear tender, temperature 99.8 at noon. Moved from hospital to hotel on fifth. Temperature normal on 8th (five days); and on 22nd, nineteen days after, no discharge, and hearing about normal.

This case seems to have taken considerable time—19 days—but my experience with these cases of infection by sea water (or nasal irrigating solutions) has been such that 19 days doesn't seem long. Here the value of the transudation of lymph by Wright's solution, which may be considered a chemical Bier's method of passive congestion, is well demonstrated.

Let us not forget also the advantages of clearing out the sides of the naso-pharynx, so as to restore ventilation and drainage through the Eustachian tubes.

It may be thought that the duration of treatment of these cases does not indicate any advantage over a simple paracentesis. Of course it is a common experience to cut a bulging drumhead and to have the inflammation subside in a few days; but it must be borne in mind that in cases above mentioned, on account of prolapse of the walls and more or less temperature, and tenderness at the tip of the bone, a mastoid operation seemed very likely in the near future, especially in cases where the inflammatory thickening of the membarna tympani and mucosa of the middle ears was so great as to result in a nipple perforation which is of almost no value as to drainage. One of my late colleagues once said he disliked to see nipple perforations because they were *always fatal.* That may have been so thirty or more years ago, but in these modern days when the mastoid operation is resorted to with much less provocation, if drainage cannot be obtained through the middle ear, it can be through the bone. But by use of Wright's solution and free incisions, it can be accomplished in almost every instance if not delayed too long, *i.e.*, until much pus has formed. Here it has not done so well. And there is a further, and probably the most important, advantage in getting at these cases as early as possible, and that is to stop inflammatory deposit which means hardness of hearing sooner or later.

# TREATMENT OF HYPERTROPHIED TONSILS AND ADENOIDS BY RADIUM, A PRELIMINARY STATEMENT.

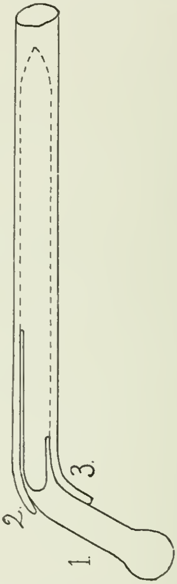
By Francis H. Williams, M.D., Boston.

The excellent paper recently published by Drs. Murphy, Wetherbee, Craig and Hussey, entitled, "Induced Atrophy of Hypertrophied Tonsils by Roentgen Ray,"* is interesting and instructive, but treating the tonsils from "under the angle of the jaw" and the adenoids "through the back of the neck" is open to the criticism of exposing to the rays other parts than those it is desired to reach. The rays from radium also act on the lymphoid tissues, of which the tonsils and adenoids are made up to a large extent, and can be applied directly to the tonsils and adenoids, the neighboring parts being protected by lead, that is to say, the radium container is covered with lead except on the side through which it is desired that the rays should issue. When as above, roentgen rays were used, the maximum amount reached other tissues than the tonsils and adenoids; when radium is employed, the maximum radiation reaches the tonsils and adenoids, and the minimum other parts. Another advantage of radium is that the output is constant, and the dosage can be exact.

I have used 50 milligrams of bromide of radium in a flat container, with the rays filtered by 0.83 millimetre o faluminum, held directly against or near the tonsil. The radium should be withdrawn every few minutes, or as often as is comfortable for the patient, until the total exposure of fifteen minutes, more or less as required, has been reached. Improvement follows promptly, but the ultimate results may be expected only after some weeks. Guided by more than seventeen years' experience in the use of radium, it seems to me better not to attempt complete healing by one treatment, for the present at least, but rather to give two or perhaps three treatments at intervals, as patients and conditions differ.

It may prove more convenient to use a container by means of which both tonsils may be treated at the same time. I have devised one to be held midway between the tonsils, which consists, in general, of a disk of lead (not more than 2 cm. in diameter and about 1 cm. thick, more so in the middle) with a hole bored through its centre, somewhat flared at each end, for the exit of the rays, and another bored from the outer edge radially to a little beyond the centre. The tube containing the radium may be slipped into this and the opening afterwards closed by screwing a metal handle part way into it. The uvula, the back of the throat and the parts behind it are thus protected by about 1 cm. of lead. When treating one tonsil only, the opening towards the other may be closed with a plug of lead. Appropriate filters should be used.

Another instrument, useful to reach parts of the throat that would not be accessible to a larger one, is shown in the cut.



This cut is one-third larger than the actual size. Below 1. is a small bulb at the end of the bent portion of a glass tube, for containing the radium. The straight end is inserted into a metal handle about 30 cm. long, of which only 7.5 cm. are shown, by lifting the spring at 2, and is held in place by a narrow strip of plaster wound around the glass and metal between 2 and 3. The radium is kept in position in the bulb by stuffing the tube with spun glass, and more spun glass is pushed in until the tube is nearly filled, the end being closed with a cork, instead of sealed off as shown in the cut. An aluminum cap, to act as a filter, is slipped over the bulb and then the bulb and bent portion of the tube are enclosed in sheet lead, except the lower end of the bulb. The lead should extend more or less beyond the bulb according to the size of the area to be treated.

Before applying the radium, the throat should be moistened with a suitable solution of cocaine to prevent gagging from the insertion of the container. All instruments should be covered with two thicknesses of rubber, and for this purpose two rubber finger cots are stretched over them and far down on the handle, where they may be secured by a strip of plaster. Of course, fresh cots should be used for each patient.

In using this method I have thus far treated the tonsil only, as the results there may be more easily observed than in adenoids. These may be reached through the nose by a small instrument, carrying radium, from the end of which the rays issue upwards.

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* Jour. A. M. A., 1921, Vol. lxxvi, p. 228.

Adenoids can also be reached by directing the roentgen rays upon them through the nose instead of through the back of the neck as described in the article referred to above. This treatment might be carried out, for example, by distending the nostrils with a special bivalve speculum, one blade inserted horizontally in each nostril, and by protecting the skin inside the speculum with oxide of zinc plaster and that outside by sheet lead. In this case the length of exposure would be shorter, for children only about one minute, than when the rays are obliged to traverse a large amount of dense tissue, and the risk of burns would be far less.

The disadavantages of operation are obvious. The roentgen rays should be employed only by physicians who have had experience in their use.

It is, of course, too early to make a definite statement concerning the comparative value of operation, roentgen rays, and radium. For adenoids the roentgen rays and radium—treatment by both of which is painless—may each be of service in a special group of patients. For the tonsils, radium, if properly used, I consider the safest and that it will probably prove to be the best treatment for many patients.

While not coming within the title of this paper, it is noteworthy that after treatment by radium, I have observed striking improvement in acute and sub-acute tonsillitis.

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# THE ENERGY REQUIREMENTS OF GIRLS FROM 12 TO 17 YEARS OF AGE.

By Francis G. Benedict, and Mary F. Hendry, Boston.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

*(Continued from page 222.)*

### SELECTION OF SUBJECTS.

Recognizing the importance of securing subjects in groups, squads or troops, preferably subjects known to each other or with at least general unified interests, we presented the whole problem to the Massachusetts Council of Girl Scouts through Mrs. James J. Storrow, whose interest made further relations possible. It would be difficult to express adequately our appreciation of the wholly extraordinary degree of coöperation, at great personal sacrifice of time and labor, on the part of several of the Girl Scout leaders, particularly the Director, Miss Alice Sanford, and the leader of Troop 11, Miss Marion C. Moreland. To secure the consent of the parents to their girls participating in tests of this kind and to assemble successfully the several groups of girls was a feat in education, diplomacy, and organization which is rarely observed, and the successful accomplishment of the same is a striking comment upon the extraordinarily high character which the Girl Scouts hold in public opinion, particularly in the opinion of the parents of the large number of girls who volunteered to coöperate in these tests.

It was decided to begin our study with the older girls first, because we felt that, psychologically, the younger girls would be much keener to carry out tests which had been already made with older girls. Secondly, the plan of collecting a group of girls for an evening and a night at the Laboratory could be developed better first with the more mature rather than with the younger girls. This order proved most successful.

All the girls were selected on the basis that they were "presumably in good health and normal." Finer differentiation as to physical condition has not thus far been made in metabolism work; it may have to be done, but it is of less importance with the group system than with the study of individuals, for even in the extreme case that an individual girl might have a basal metabolism 50 per cent. above normal, with a group of 12 girls this would affect the average value of the entire group only by 4 per cent. Still, every effort was made to select girls who were presumably in good health.

In forming our groups we attempted to secure uniformity, first, as regards age, and in the age groups attempted to obtain further uniformity by limiting the range of weight and height, but with the best of intentions it was almost impossible to adhere to this latter point. Even as regards uniformity in age, the basic ground for classification, certain groups included girls with a wider age range than was desirable, and while the average age of the groups differed by approximately one year, the fact must not be lost sight of that in certain instances girls a little too old or a little too young for this age designation were included. It was soon found that, although we could draw for the major part from two of the largest troops of Girl Scouts in Boston, there were not sufficient girls of uniform age to permit sharp specifications as to height and weight, and so very considerable height and weight variations entered into all the groups. Here, again, however, emphasis must be laid upon the fact that with the group system such variations play a relatively minor rôle, and while there is a distinct disadvantage in grouping all the girls under one average figure, thus losing their individuality, so to speak, there is a distinct advantage in that abnormalities, even if of considerable magnitude, are almost without effect upon the average figure. Finally, at the critical prepubertal and pubertal ages of 13 and 14 years attempts were made to secure groups in which the most decisive criterion of puberty in females, namely, menstruation, had or had not appeared. With all of these attempts at grouping certain variations unavoidably crept in.

### PROGRAM.

The squad, in Girl Scout uniforms, usually arrived at the Laboratory in charge of a Scout leader not far from 5 P.M., and sat down to supper, served in the library of the Laboratory, in conjunction with the experimenters and with the squad leaders at 6 o'clock. As many of the girls had formerly been in Girl Scout camps, this part of the evening was looked upon as a "lark," a revival of the summer camp and "mess" table. The girls had been requested to eat nothing after 2 P.M., or if they had inadvertently eaten confectionery or fruit, to report it. There was no instance where such were eaten in sufficient magnitude to affect the results in any way. After supper the table was cleared and the girls were given an evening's entertainment consisting of educational and entertaining motion picture films, interspersed with short talks upon the object of the Girl Scout experiments. There was likewise a brief description given, illustrated with motion picture films, of the methods of study of the heat production of infants and young children. Opportunity was afforded the girls to visit various parts of the Laboratory, where apparatus was demonstrated to them. During the evening, also, a group photograph of the squad with squad leaders was taken.

From 10 to 10.30 P.M., the girls prepared for bed, at which time records of weight and height were obtained. To avoid the error due to clothing each girl was weighed with a previously weighed sheet, so that the nude weight was available. After being weighed and measured, the girls entered the respiration chamber, popularly termed the "bungalow," and in the later experiments at least were again weighed with the nightdress on, just prior to going to bed, on scales sensitive to 10 grams. At this second weighing, the exact time was recorded, and each girl was cautioned to wear the next morning, when being weighed again, exactly the same handkerchief, hair ribbon, hair pins, wrist watch, or any other accessory that she had on at the time. All these weights were taken without slippers, the purpose being to secure the true loss in body weight throughout the night by making another weighing under exactly the same conditions the next morning before the bladder was emptied, and thus secure data with regard to the insensible perspiration.

Immediately after being weighed, the girls went to their separate beds and quieted down for the night. Instructions were then given as to the morning routine, the chief new factor of which was the counting of the pulse rate by two of the experimenters. Specific directions were given the girls as to how to raise the cover of the chamber immediately, in case of urgent need of leaving. It is worthy of special note in this connection that on the nine nights, in which, all told, 95 girls participated, in no instance was it necessary to take a girl out of the respiration chamber and in no instance did a girl hesitate to go in, thus testifying to the perfect organization of the Girl Scouts and the confidence that they had in their leaders. After these instructions the cover of the chamber was then closed, the lights were put out, black curtains drawn over the glass windows, and the subjects cautioned to remain quiet and go to sleep as soon as possible.

To minimize the correction for residual carbon dioxide necessary to be made for the carbon-dioxide measurements of each period, we took advantage of the first hour, when the subjects were more or less active and restless, some of them awake, to allow the carbon dioxide to accumulate, and did not begin the true metabolism measurements until later. At the end of approximately an hour the ventilation was started, a sample of the residual air taken for the calculation of the carbon dioxide in the

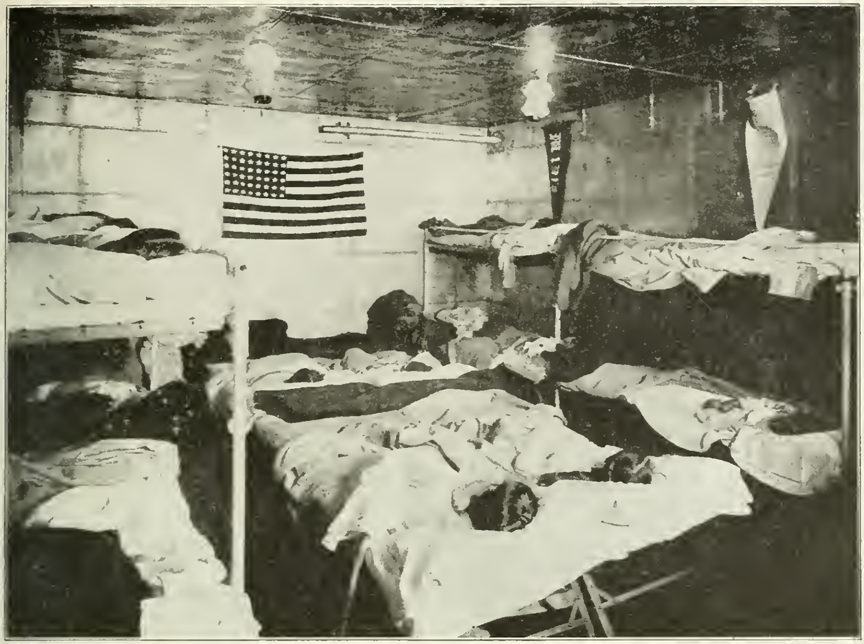

Fig. I.—Interior of Group Respiration Chamber, Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.
Twelve Girl Scouts in Bed, Prior to Beginning Test.

chamber, and the first experimental period entered upon.

Periods of one-half hour each were usually made until approximately 2.30 A.M. From there on the periods were lengthened to an hour, and on the nights when the respiratory quotient was determined all ventilation was shut down for another hour and a half, to allow the residual carbon dioxide to accumulate. The total carbon-dioxide production during these periods with no ventilation was always determined by analysis. In the last hour or hour and a half the ventilation was again started and the usual procedure followed. At 6.30 A.M. the cover was usually opened, the chamber rapidly ventilated with a high speed blower, and two experimenters entered the chamber quietly and took the resting pulse rate of each of the subjects. After the pulse rates had been taken, the subjects were called in numerical order, were weighed carefully, the time being recorded, and then left the chamber and dressed, preparatory to breakfast. Breakfast was served in a considerable variety and unlimited quantity to the group as a whole, with absolutely no restrictions, and the girls then left the Laboratory with their squad leader for their respective homes.

A relatively large percentage of the girls volunteered to come at any subsequent date that we could use them, and on the nights when special groups in the 13 and 14-year-old ages were desired, advantage was taken of their offer, so that some of the girls appeared in more than one group. Furthermore, in certain groups where one or two girls were distinctly outside the age range for the specific group, they were requested to come again in the age group under which they would more closely fit. Thus, as a matter of fact, three girls actually appeared three different times in certain groups.

### PROBLEMS STUDIED.

*Pulse Rate.* The opportunity of studying groups of young, normal girls, resting quietly, sound asleep, made us desirous of securing all possible physiological data on them, since information with regard to the physiology of

TABLE III.—INDIVIDUAL AND AVERAGE VALUES FOR AGE, BODY WEIGHT, HEIGHT, AND PULSE RATE[1] OF GIRLS.

| Date and subject number[2] | Age |  | Body weight (without clothing) | Height | Pulse rate |  |
|---|---|---|---|---|---|---|
|  |  |  |  |  | First count | Second count |
| 1920 | yrs. | mos. | kgs. | cms. |  |  |
| March 12-13 |  |  |  |  |  |  |
| 67 | 13 | 8 | 36.3 | 148 | 70 | -- |
| 68 | 13 | 1 | 47.4 | 164 | 95 | 92 |
| 69 | 12 | 9 | 46.1 | 157 | 76 | 80 |
| 70 | 13 | 0 | 34.8 | 149 | 53 | 56 |
| 71 | 12 | 5 | 35.8 | 139 | 80 | 76 |
| 72 | 12 | 10 | 38.9 | 152 | 87 | 81 |
| 73 | 13 | 0 | 39.9 | 148 | 85 | 77 |
| 74 | 12 | 4 | 46.0 | 153 | 77 | 76 |
| 75 | 12 | 9 | 41.6 | 152 | 66 | 60 |
| 76 | 12 | 4 | 43.7 | 152 | 77 | 94 |
| 77 | 12 | 10 | 34.5 | 146 | 78 | 81 |
| 78 | 13 | 4 | 47.4 | 158 | 69 | 71 |
| Avg. | 12 | 10 | 41.0 | 152 | 76 | 77 |
| March 19-20 |  |  |  |  |  |  |
| 44 | 14 | 1 | 44.5 | 182 | 76 | 76 |
| 45 | 13 | 6 | 55.7 | 157 | 71 | 70 |
| 39 | 14 | 4 | 59.9 | 182 | 70 | 74 |
| 79 | 13 | 8 | 50.6 | 161 | -- | -- |
| 80 | 14 | 3 | 58.6 | 181 | 74 | 84 |
| 81 | 14 | 3 | 55.7 | 166 | 84 | 83 |
| 82 | 14 | 3 | 44.8 | 154 | 84 | 79 |
| 83 | 13 | 9 | 52.5 | 164 | 103 | 88 |
| 84 | 13 | 10 | 41.0 | 158 | 77 | 90 |
| 85 | 13 | 9 | 38.8 | 151 | 94 | 85 |
| 86 | 13 | 10 | 71.5 | 168 | 75 | 72 |
| 87 | 14 | 6 | 48.6 | 162 | 70 | 67 |
| Avg. | 14 | 0 | 51.7 | 161 | 80 | 79 |
| April 9-10 |  |  |  |  |  |  |
| 35 | 13 | 11 | 57.2 | 171 | 76 | 78 |
| 44 | 14 | 1 | 45.1 | 162 | 98 | 94 |
| 39 | 14 | 5 | 62.2 | 162 | 73 | 78 |
| 88 | 14 | 9 | 37.0 | 157 | 73 | 77 |
| 89 | 14 | 6 | 41.4 | 154 | 86 | 73 |
| 90 | 14 | 4 | 45.3 | 152 | 72 | 80 |
| 91 | 13 | 7 | 46.7 | 160 | 70 | 66 |
| 92 | 14 | 7 | 33.8 | 145 | 88 | 95 |
| 93 | 13 | 3 | 40.8 | 149 | 92 | 89 |
| 94 | 13 | 8 | 40.8 | 144 | 72 | 82 |
| 95 | 13 | 9 | 35.8 | 151 | 71 | 70 |
| Avg. | 14 | 1 | 44.2 | 155 | 77 | 80 |

TABLE III.—INDIVIDUAL AND AVERAGE VALUES FOR AGE, BODY WEIGHT, HEIGHT, AND PULSE RATE[1] OF GIRLS. (*Continued.*)

| Date and subject number[2] | Age |  | Body weight (without clothing) | Height | Pulse rate |  |
|---|---|---|---|---|---|---|
|  |  |  |  |  | First count | Second count |
| 1920 | yrs. | mos. | kgs. | cms. |  |  |
| Jan. 23-24 |  |  |  |  |  |  |
| 35 | 13 | 8 | 58.7 | 169 | 88 | 82 |
| 36 | 13 | 7 | 33.3 | 145 | 84 | 81 |
| 37 | 14 | 3 | 50.7 | 160 | 65 | 70 |
| 38 | 13 | 7 | 55.3 | 158 | 68 | 62 |
| 39 | 14 | 2 | 59.2 | 161 | 80 | 77 |
| 40 | 14 | 3 | 52.7 | 161 | 85 | 88 |
| 41 | 13 | 3 | 49.2 | 153 | 86 | 88 |
| 42 | 12 | 10 | 42.2 | 165 | 102 | 99 |
| 43 | 14 | 1 | 41.7 | 150 | 78 | 76 |
| 44 | 13 | 11 | 44.2 | 160 | 96 | 87 |
| 45 | 13 | 10 | 56.7 | 169 | 82 | 80 |
| 46 | 13 | 4 | 55.7 | 157 | 82 | 85 |
| Avg. | 13 | 8 | 50.0 | 159 | 83 | 81 |
| Feb. 13-14 |  |  |  |  |  |  |
| 35 | 13 | 9 | 58.2 | 189 | 80 | 76 |
| 36 | 13 | 8 | 33.7 | 145 | 74 | 74 |
| 47 | 12 | 10 | 41.7 | 149 | 96 | 88 |
| 38 | 13 | 8 | 56.2 | 158 | 70 | -- |
| 48 | 13 | 8 | 40.2 | 143 | 90 | 82 |
| 49 | 14 | 0 | 41.7 | 157 | 72 | 70 |
| 50 | 13 | 2 | 42.7 | 148 | 98 | 90 |
| 51 | 12 | 11 | 36.7 | 152 | 86 | 84 |
| 52 | 12 | 8 | 41.7 | 154 | 56 | 64 |
| 53 | 12 | 6 | 40.7 | 154 | 80 | 80 |
| 54 | 13 | 0 | 36.2 | 151 | 94 | 96 |
| 46 | 13 | 5 | 54.2 | 157 | -- | 79 |
| Avg. | 13 | 4 | 43.7 | 153 | 81 | 80 |
| March 5-6 |  |  |  |  |  |  |
| 55 | 12 | 6 | 40.7 | 155 | 96 | 83 |
| 56 | 12 | 6 | 37.7 | 157 | 88 | 84 |
| 57 | 11 | 7 | 38.7 | 150 | 88 | 75 |
| 58 | 12 | 6 | 27.7 | 144 | 80 | 82 |
| 59 | 11 | 9 | 36.7 | 143 | 74 | 73 |
| 60 | 12 | 1 | 39.7 | 143 | 76 | 74 |
| 61 | 12 | 5 | 37.2 | 146 | 86 | 76 |
| 62 | 12 | 4 | 40.7 | 150 | 84 | 78 |
| 63 | 12 | 8 | 37.7 | 146 | 91 | 88 |
| 64 | 11 | 7 | 43.2 | 154 | 85 | 88 |
| 65 | 11 | 11 | 49.2 | 153 | 86 | 100 |
| 66 | 12 | 5 | 44.7 | 154 | 98 | 90 |
| Avg. | 12 | 2 | 39.5 | 150 | 86 | 83 |

Table III.—Individual and Average Values for Age, Body Weight, Height, and Pulse Rate[1] of Girls. (*Continued.*)

| Date and subject number[2] | Age | | Body weight (without clothing) | Height | Pulse rate | |
|---|---|---|---|---|---|---|
| | | | | | First count | Second count |
| 1920<br>Jan. 2-3 | yrs. | mos. | kgs. | cms. | | |
| 1 | 15 | 9 | 61.1 | 164 | 87 | 90 |
| 2 | 16 | 11 | 58.0 | 154 | 68 | 78 |
| 3 | 16 | 3 | 53.1 | 153 | 60 | 63 |
| 4 | 16 | 9 | 73.0 | 168 | 64 | 66 |
| 5 | 18 | 0 | 57.0 | 160 | 68 | 65 |
| 6 | 17 | 3 | 54.1 | 171 | 87 | 80 |
| 7 | 17 | 3 | 64.2 | 168 | 75 | 76 |
| 8 | 17 | 1 | 52.9 | 171 | 79 | 75 |
| 9 | 16 | 3 | 61.0 | 162 | 89 | 85 |
| 10 | 17 | 1 | 51.6 | 160 | 71 | 86 |
| 11 | 17 | 8 | 55.6 | 165 | 93 | 89 |
| 12 | 17 | 4 | 56.6 | 161 | 77 | 77 |
| Avg. | 17 | 0 | 58.1 | 163 | 76 | 78 |
| Jan. 9-10 | | | | | | |
| 1 | 15 | 9 | 60.6 | 164 | 91 | 92 |
| 13 | 15 | 9 | 40.4 | 165 | 82 | 84 |
| 14 | 15 | 5 | 62.8 | 158 | -- | 74 |
| 15 | 16 | 0 | 49.1 | 162 | 89 | 87 |
| 16 | 15 | 7 | 49.7 | 167 | 75 | 80 |
| 17 | 15 | 3 | 50.6 | 167 | 72 | 74 |
| 18 | 15 | 7 | 77.5 | 172 | 60 | 60 |
| 19 | 14 | 10 | 57.1 | 166 | 79 | 68 |
| 20 | 16 | 6 | 50.1 | 157 | 74 | 86 |
| 21 | 15 | 8 | 47.0 | 157 | 72 | 72 |
| 22 | 16 | 6 | 53.8 | 159 | 62 | 59 |
| 23 | 16 | 3 | 45.1 | 167 | 80 | 65 |
| Avg. | 15 | 10 | 53.6 | 163 | 74 | 72 |
| Jan. 16-17 | | | | | | |
| 24 | 16 | 0 | 43.5 | 153 | 84 | 82 |
| 25 | 15 | 5 | 45.8 | 157 | 78 | 78 |
| 26 | 14 | 7 | 50.5 | 160 | 60 | 80 |
| 27 | 14 | 5 | 45.1 | 159 | 99 | 96 |
| 28 | 14 | 4 | 57.3 | 150 | 85 | 84 |
| 29 | 14 | 8 | 54.5 | 161 | 88 | 84 |
| 30 | 14 | 7 | 45.5 | 166 | 95 | 86 |
| 31 | 15 | 3 | 61.5 | 170 | 86 | 89 |
| 32 | 14 | 5 | 47.9 | 166 | 84 | 80 |
| 33 | 15 | 1 | 44.0 | 156 | 88 | 88 |
| 34 | 14 | 6 | 52.8 | 167 | 98 | 88 |
| Avg. | 14 | 10 | 49.9 | 160 | 86 | 83 |

[1] The records of pulse rate were obtained between 6.30 A.M. and 7.00 A.M., while the girls were lying quietly, prior to rising and having breakfast.

[2] Subject numbers underlined represent girls who have *not* reached puberty.

young girls is extremely scarce. Even with so commonly and so readily observed a factor as pulse rate almost no information is available as to the resting pulse of normal girls. The resting pulse rate of these girls after a night of quiet, deep sleep inside the chamber was, therefore, counted each morning.

*Insensible Perspiration.* The total loss in body weight due to the vaporization of water from the lungs and skin and to the oxidation of organized tissue in the body is the so-called "insensible perspiration." This is measured by noting the true loss in weight over a number of hours. This measurement involves that all clothing and accessory appurtenances must be the same at the beginning and end of the observation and that during this time either no urine and feces are passed and no food and water taken, or else that they are properly corrected for. Obviously this measurement does not call for a respiration chamber and was only an incidental observation.

*Gaseous Metabolism.* The prime object of this whole series of experiments was to measure not the pulse rate or the insensible perspiration, but the gaseous metabolism, and from that compute the energy transformations of young girls. For this purpose the respiration chamber was devised, and the whole experimental plan was dominated by this main idea. The measurements of the gaseous metabolism began not far from 11 o'clock at night and continued, uninterrupted, until 6.30 in the morning, in periods ranging in duration from one-half to one hour, or, at times, one and one-half hours. From these data we are able to secure information with regard to two important points. In the first place, from a careful examination of the individual periods we can note the actual minimum carbon-dioxide production throughout the night, or the true basal value, and since all the groups were studied under the same conditions with regard to quantity of food and time of eating and with regard to muscular repose (the girls being sound asleep in bed)[*] comparable basal values for the different ages can be secured. Secondly, the measurement of the total carbon-dioxide production during the night enables us to compute the actual energy consumption during the average night in bed, that is, the total energy requirement for from 8 to 10 hours, the ordinary "in bed" period of young girls. This of itself is of considerable importance as it represents the energy production for 10 of the 24 hours of every child's life. In our discussion of results, therefore, it is natural that emphasis should be laid upon the measurement of the gaseous metabolism, with special reference to the basal or minimum, as well as the total energy production during bed rest. This last is also not without clinical and hospital interest as indicating the metabolism of patients in bed.

### DISCUSSION OF RESULTS.

*Normality of Girls Studied.* Since this study was purposely designed to represent normal girls as nearly as possible and to fill the need for normal material, particularly in connection with basal metabolism, it is important to examine our data anthropometrically, to establish the approximate degree of normality of our girls when compared with so-called standards for age, weight and height established by other investigators. In Table III are given the individual and average ages, weights and heights of our girls, together with subject numbers and dates of observations.

While it is not wholly inconsistent to consider the average weight of girls 12 years of age or younger, it is quite clear that with the higher ages the weight increment per year is by no means so great as it is with the lower ages, and consequently one would expect that 12-year-old girls as a whole would run more nearly to an average weight than 17-year-old girls. Nevertheless, since our study deals solely with groups and the individual, as such, is completely lost in the measurements, we have deemed it advisable to consider only the average weights and heights for the various groups and we will compare these with the average weights and heights of girls in other well-established series of measurements. Accordingly in Table IV we give the average weights and heights of our girls, arranged according to decreasing ages, and for comparison with them have also given the weights and heights for the corresponding ages as obtained from the smoothed curves representing the girls measured by Wood and the private school girls of Benedict and Talbot.

*(To be continued.)*

## Book Review.

*Pulmonary Tuberculosis.* By Edward O. Otis, M.D. Boston: W. M. Leonard, 1921.

We are glad to see this new and enlarged edition of Dr. Otis's book. While technically it is called a new edition, it is practically a new book, so much material having been added to it that was not in the first edition.

The great fault that the reviewer finds with many treatises on tuberculosis intended, as announced in the preface, for the general practitioner or student, is that they contain too much, with the result that the person looking for information is lost in the multiplicity of detail. Dr. Otis's book does not have this fault. Sufficient detail is given to answer every purpose, and yet the main object in view is never lost sight of.

The value of the book is increased by having added to it the "Diagnostic Standards" prepared for the Framingham Demonstration, the diagnostic theses of Dr. Lawrason Brown, and likewise a number of illustrative cases. His chapter on the examination of soldiers for tuberculosis, along with the "Simplified Rules for Tuberculosis Examination," by Major Stoll, are likewise a welcome addition.

The paper is good, the print excellent, and the division of the subject matter into plainly labeled paragraphs, makes it easy to read and facilitates the finding of any one special point. As a writer of medical English, Dr. Otis has always ranked high. The reviewer gladly recommends this book as one which will prove of distinct value to students and to teachers, and to the medical profession at large.

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[*] As early as 1895, Sondén and Tigerstedt (Skand. Arch. f. Physiol., 1895, Vol. vi, p. 149), in their monumental research on the metabolism of children, emphasized the fact that to determine the influence of age and body size upon the intensity of the metabolism, the best results will be obtained by studying the metabolism during deep sleep.

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## PSYCHOLOGY AND MEDICINE.

In its relation to medicine, the science of psychology presents a number of aspects which might be developed further to the distinct advantage of the medical profession. Although the significance of psychological phenomena in medical problems has been recognized in a general way, the more specialized study of psychology in its medical relations, as a study of experience and behavior from a biological point of view, presents a subject comparatively new. In this connection, Dr. Robert M. Yerkes, in an interesting discussion of "The Relations of Psychology to Medicine," before the American Association for the Advancement of Science, has formulated suggestions in regard to the introduction into medical schools of a science which shall deal with the more direct problems of psychology and medicine, a science for which the name "psychobiology" has been proposed.

Hitherto, physiology has neglected those functional aspects of human life which may be designated as behavior, experience, and mind. These phenomena, if methods could be devised for their exact study, would constitute appropriate material for physiological observation; through our increased knowledge gained by the science of psychology, we are now in a position to gain such facts, which are of considerable theoretical and practical importance.

Of the various aspects of modern psychology, there are three which have a particular significance from the standpoint of medicine: introspective psychology, genetic psychology, and behaviorism. The observations of introspective psychologists in regard to experience and its expressions, cannot be disregarded by medicine; genetic psychology and its study, by both objective and subjective methods, of behavior and experience, when the method of comparison is applied to materials of observation, is associated even more intimately with medical science. But of still greater significance to medicine is the recent development of so-called "behaviorism," which extends application of the objective methods of physiology to all types and aspects of human activity and experience by subjecting to scientific analysis and measurement instinctive, habitual, and voluntary actions. By the further development of psychobiology, there could be studied by introspective psychology, genetic psychology, and behaviorism, phenomena which should be valuable to medicine.

If it be granted that the science of psychobiology be of sufficient importance to medicine to justify its introduction in medical schools, it remains to be considered how this might be undertaken. Dr. Yerkes has suggested the following outline of activities as practicable in the larger medical schools, provided a thoroughly competent biologically trained psychologist is available:

I. There could be presented initially, as a voluntary course, if it is not expedient to add a new subject to the curriculum, a lecture, demonstration and laboratory course in psychobiology, which should acquaint medical students with the principal facts and laws of human behavior and experience and with the more important methods of observing and measuring these phenomena.

II. A groundwork in psychobiology having been prepared by the general course, opportunity should be afforded interested students for more intensive training in the use of psychobiological methods. This should provide alike for training in the methods of practical measurement and for psychobiological research. In connection with the latter, investigation might be undertaken of problems formulated in the lecture course in connection with such topics as the analysis of instinctive activities; the development, modification, and integration of habits; the nature and significance of ideational types; the discovery of peculiarities or defects of behavior and experience. Similarly in connection with practical psychobiological measurement, the medical student might be given opportunity to utilize or develop methods of measuring aspects of behavior and experience in relation to diagnosis and treatment. Important types of practical psychological tests might also be exhibited in their relations to medical aspects of hygienic, industrial, and educational problems.

III. As an extension of psychobiology toward psychiatry, special lectures and laboratory exercises dealing with atypical, abnormal, or pathological behavior and experience, could be provided. These might ultimately be expected to develop into a systemic course in psychopathology, which should be carefully correlated with the established medical instruction in neurology and psychiatry. In this same connection, as a method of supplementing such practical and research activities as are referred to in the preceding paragraph, psychobiological methods might be placed at the service of the neurological and psychiatric clinics, for psychology has already developed a considerable array of methods whose diagnostic value in neuropsychiatric practise has been definitely established.

IV. Another important field of service for psychobiology is preventive medicine and hygiene. Here research in connection with the characteristics and variations of behavior and experience which are significant of undesirable or dangerous nervous or mental tendencies, is particularly in point, although didactic lectures might also be offered to advantage. Thus psychobiology might be utilized increasingly as the partial scientific basis of mental hygiene.

Dr. Yerkes is convinced that there exists a need for developing psychobiology as a basic medical science; it is a project to which the profession may wish to give thought and consideration.

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## MEDICAL NOTES.

Norbury Sanatorium Appointment. — Dr. Samuel N. Clark, Associate Division of Neurology and Psychiatry, University of Illinois, Medical Department; also Clinical Psychiatrist to the Illinois State Psychopathic Institute, and Secretary of the Chicago Neurological Society, has been appointed Psychiatrist to the Norbury Sanatorium, Jacksonville, Illinois.

Reception in Honor of Dr. William W. Keen.—In honor of the eighty-fourth birthday of Dr. William W. Keen, a dinner and reception given by the medical profession of Philadelphia, was attended by six hundred physicians and friends on January 20. Among the speakers were Dr. George de Schweinitz, Dr. William H. Welch of Baltimore, and Dr. J. Chalmers DaCosta of Philadelphia. A volume containing addresses and letters was presented as a tribute to Dr. Keen by Major-General Merritte W. Ireland, Surgeon-General of the United States Army, and a life size bust of Dr. Keen in army uniform, by Samuel Murray, was presented by Dr. William J. Taylor of the College of Physicians.

Tribute to Dr. Roentgen.—The twenty-fifth anniversary of the discovery of the roentgen ray by Dr. Roentgen has been celebrated in Germany. Dr. Roentgen retired last year from the chair of experimental physics at the University of Munich.

Missouri Society for Mental Hygiene.—At the organization of the Missouri Society for Mental Hygiene at St. Louis on January 13, the following officers were elected: President, Dr. M. A. Bliss; Secretary, Dr. J. F. McFadden; Treasurer, Dr. J. E. W. Wallen.

Hospitals for Disabled Soldiers. — There has been passed recently a bill authorizing the construction of five hospitals, at an estimated cost of $12,500,000, for the benefit of men disabled in the war. An additional $500,000 is to be made available for converting buildings into hospitals at Walla Walla, Washington, and Fort McKenzie, Wyoming. The bill also authorizes the Secretary of the Treasury to leave subject to appropriation by Congress, the proposed $3,000,000 hospital to be built by the State of New York. Although the specific location of the five hospitals has not yet been determined, one is to be in the Central Atlantic Coast States, one in the Great Lakes region, one in the Central Southwest, one in the Rocky Mountain States, and one in Southern California. Three hospitals, it is planned, would be used for the care of men suffering from mental and nervous disorders, and two for the treatment of tubercular patients.

The Chalmers Collection.—A valuable collection of medical books, chiefly on tropical diseases, and including some incunabula of inestimable value, has been presented by Mrs. Chalmers to the Royal Society of Medicine, and is to be known as the "Chalmers Collection," in memory of her late husband, Dr. A. J. Chalmers. The sum of £500 has been given by Mrs. Chalmers for the furnishing of a room in which the books are to be kept. About sixty volumes from Dr. Chalmers' library have been given to the Royal College of Physicians of London.

Plans to Prevent Typhus.—At a recent conference of federal officials, new methods were considered for safeguarding the people of the United States from the introduction of typhus from Europe. New regulations are to be adopted as a result of a survey of the situation in New York as revealed in a report from the Assistant Surgeon-General. The prohibition of admission of immigrants from typhus-infected districts of Europe is considered unwarranted in view of the precautions already taken and contemplated.

### BOSTON AND MASSACHUSETTS.

The Reporting of Lethargic Encephalitis.—Announcement has been made that after March 1, physicians throughout the State will be required to report to the State Department of Health all cases of lethargic encephalitis which come to their attention. This action has been taken in order that the Department may have a better opportunity for investigating the disease. During the month of January, forty-three cases of this disease have been reported to the Health Department, and eleven have been reported during the first half of February. Investigation thus far has failed to show whether or not the disease is communicable; it is important that all possible information be obtained in regard to it in order that measures may be adopted for its prevention. On February 12, five cases of the disease were reported in Holyoke, and four cases have been reported from Springfield since January 1.

Massachusetts Homeopathic Hospital.—Owing to the rapid growth of the various sections of the Out-Patient Genito-Urinary Department of the Massachusetts Homeopathic Hospital, there are several vacancies on the staff. Included in the Genito-Urinary Department are various sub-sections: diseases of kidneys and bladder, diabetes, gonorrhea in male and female, syphilis. Anyone interested should apply for further information to Dr. Henry M. Pollock, Supterintendent, Massachusetts Homepathic Hospital, or to Dr. S. H. Blodgett, Chief of Clinic, 520 Beacon Street, Boston.

Work of the Boston Dispensary.—The tabulated reports of the Boston Dispensary show that during the year 1920, 152,508 visits were made by patients to the Dispensary, of which 111,126 were in the morning clinics and 41,382 in the evening pay clinics for working people of moderate means. The Dispensary district physicians made 6,171 home visits on patients too ill to go to the Dispensary.

On February 1, 1921, Dr. Herman A. Osgood was appointed Consultant Roentgenologist and Chief of the X-ray Department. The X-ray Department is open daily from 9 a.m. to 5 p.m. and on Monday and Friday evenings from 6 to 8.30.

On March 2, a special evening clinic was started in the Gynecological Department, of which Dr. Malcolm Storer is the Chief, for the special study of dysmenorrhea and sterility. This clinic is under direct charge of Dr. Samuel R. Meaker. For the present it will be conducted Wednesday evenings from 6 to 8.30, and will be on the same pay basis as the already established evening clinics at the Dispensary.

Harvard Graduate School of Medicine Worcester Extension Course.—In arranging for the Extension Course this year, it seemed worth while to vary the plan somewhat by offering a longer series of lectures by a single authority. The popularity of Dr. Frederick T. Lord's previous lectures led him to be invited to give the course this year, the dates and subjects of which follow:

March 16. Suggestions regarding history taking and physical examination. Special tests in certain groups of cases.

March 23. Certain aspects of pulmonary disease, diagnostic hints and therapeutic suggestions.

March 30. Lobar pneumonia and serum treatment.

April 6. Diagnosis and treatment of cardiac disease. Cardiac irregularities.

April 13. Diagnosis and treatment of nephritis. Tests of renal function.

April 20 Immunity. Vaccine therapy. Lumbar puncture. Examination of spinal fluid.

Those who desire to enroll for the course, should forward check for ten dollars to Dr. William F. Lynch, 390 Main Street, Worcester. If the enrollment is sufficient, continuation of the course will be arranged as heretofore. Place of meeting will be announced before the first lecture.

Week's Death Rate in Boston.—During the week ending February 26, 1921, the number of deaths reported was 213 against 364 last year, with a rate of 14.66 against 23.48 last year. There were 35 deaths under one year of age against 48 last year.

The number of cases of principal reportable diseases were: Diphtheria, 63; whooping cough, 12; scarlet fever, 60; typhoid fever, 8; measles, 109; tuberculosis, 48.

Included in the above, were the following cases of non-residents: Diphtheria, 12; scarlet fever, 6; measles, 28; tuberculosis, 13.

Total deaths from these diseases were: Diphtheria, 8; scarlet fever, 1; measles, 6; tuberculosis, 12.

Included in the above, were the following non-residents: Diphtheria, 3; tuberculosis, 2.

Encephalitis lethargica: cases, 4; deaths, 2.

Morbidity and Mortality in Boston.—Officials in the Health Department of the City of Boston are very much concerned with the report of eight cases of typhoid fever in one week. Since the first of the year, and up to the end of the week, closing February 19, only seven cases, in all, were reported; but in the week of February 26 there were eight more cases.

Diphtheria deaths numbered eight. This was the highest number of the winter. There were 67 cases of sickness from that dread disease reported. Measles also reached its highest in deaths, claiming six. There was an epidemic of measles, for 109 cases were reported.

Cancer deaths dropped from 24 for the preceding week to 14. There were four deaths from erysipelas, one from scarlet fever, 13 from lobar pneumonia, and seven from bronchopneumonia, 15 from Bright's disease and nephritis, and 28 from heart disease. Almost one-third—73 in all—were more than 60 years old. Eleven deaths were accidental or caused by violence.

Two deaths from encephalitis lethargica were reported. Of the 213 deaths, 135 were those of persons born in the United States, 51 were children under five years old, and 103 died in public institutions.

## Correspondence.

### REPORTABILITY OF ENCEPHALITIS LETHARGICA.

Boston, February 18, 1921.

*Mr. Editor:—*

At a meeting of Dr. Eugene R. Kelley, Commissioner of Public Health, and the Public Health Council of Massachusetts, it was voted to declare encephalitis lethargica a disease dangerous to the public health and, as such, reportable.

This action was instituted in order that further investigation might be made of the incidence, etiology and mode of transmission of this disease. A special pamphlet on encephalitis lethargica will be distributed to the physicians of the state.

This condition, up to this time, has been voluntarily reported by the physicians of the state, and about 75 cases have been investigated by the Department. Of this group there were but five children, the remaining cases being adults.

Of 28 cases cared for in certain of the Boston hospitals, an increase in the cell count of spinal fluid has been noted, varying from 15 to 50 mononuclear. In this small group there has not been a single incidence of secondary infection or multiple cases in a household, or any localized grouping of cases.

The Department is also circularizing the physicians of the state regarding typhus fever, calling to their attention the need of greater vigilance in the differentiation of the exanthematous conditions. While no great apprehension is entertained that typhus fever is to be introduced into Massachusetts, the unusual increase of immigration of course makes this possible.

By direction of the Commissioner of Public Health,

Very truly yours,
B. W. Carey,
*Director of Division of Communicable Diseases.*

### NOTICES.

A clinical meeting in the auditorium of the Beth Israel Hospital, Wednesday evening, March 9, at 8.15.

"Cardio-Vascular Diagnosis," Dr. Paul White.

Discussion: Dr. S. A. Levine, Dr. Harry Linenthal, Dr. Joseph H. Pratt.

Dr. Hyman Morrison will preside.

E. Grenville Crabtree, M.D., *Secretary.*

The Harvey Society.—Saturday evening, March 12, at 8.30 o'clock, the eighth lecture of the series will be given by Dr. S. B. Wolbach, Associate Professor of Pathology and Bacteriology, Harvard University, on "Typhus Fever and Rickettsia." at the New York Academy of Medicine, 17 West 43rd Street, New York City.

Harvard Medical Society.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance,) Tuesday evening, March 15, at 8.15 o'clock.

Program by members of the staff of the Massachusetts General Hospital.

1. Oxygen Inhalation in Conditions of Oxygen Want. A. T. Barrach.
2. Blood Pigment Metabolism. Chester Jones.
3. Electrocardiographic Evidence of Progressive Myocardial Degeneration. C. S. Burwell.
4. Local Chemical Factors with a Bearing on Resolution and Recovery in Lobar Pneumonia. F. T. Lord.

Medical students and physicians are cordially invited to attend. Cyrus C. Sturgis, *Secretary.*

The Boston Medical and Surgical Journal

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# Address

## BONE SETTERS, OSTEOPATHS AND PHYSICAL THERAPEUTICS.

By E. H. BRADFORD, M.D., BOSTON.

TIME was, and not so long ago, when medical practice was based largely upon conjectures. Drugs were given because for a long time they were supposed to do good. Blood-letting removed peccant humors, sarsaparilla purified the blood, and alcohol was believed to act as a tonic.

It is hoped that medicine has definitely outgrown this stage of loose thinking and superstition, and attempts now to reason clearly from demonstrated facts. But the general public is slow to give up the idea that the art of healing is a power inherent in certain individuals. Many a man who would never think of asking a "divine healer" to mend a damaged motor car will not hesitate to give to an untrained man of assurance the responsibility of treating symptoms of faulty metabolism or malignant disease.

There is often a belief among the laity that physicians are bigoted, prejudiced and not ready to receive the ideas of untutored minds, who claim to get results by unacademic ways. Perhaps this is the reason why the bone-setter, the osteopath, often had and have vogue, or can it be that the art of surgery is still incomplete and that there still remain some gaps not yet filled in which empiricism flourishes. Owing to the remarkable development of surgery, the demand upon the surgeon for serious operative undertakings has been so great that he is forced to turn from many minor methods of relief. In the days of Ambrose Paré the surgeon dressed wounds empirically. Today he operoperates on shielded tissue and leaves repair to the *vis medicatrix naturae.* Perhaps the chiropractic practitioner may be right in claiming his title in thinking that the work of the hand properly directed may be of service in restoring function.

Of all the unacademized practitioners, the "bone-setter" enjoyed the best name. There is an Anglo-Saxon directness in the term which should prompt the sufferer to claim the aid of a proficient and there may be surprise that bone-setters have been euphemistically supplanted by those using as their appellation the badly coined word, "osteopath." In the pre-anesthetic days the reduction of dislocations and the setting of broken bones required hardihood and experience, not easily acquired by ordinary medical men in country districts. It is not strange that the father who had worked out useful grips and manipulations should have taught the secrets of his art to his son or to apprentices and should claim preëminence.

Bone-setters were originally more common in England than in this country. The few who formerly practised here are in many places forgotten and it is difficult to learn whether their practice was the same as that of their more prominent English colleagues. The art was chiefly an English art, developed under existing conditions of English practice somewhat different from those in this country, when anyone could practise medicine with the title of doctor, without a medical training or degree. By men of this character the dignified self-given title of doctor would be more attractive than that of bone-setter, which limits the claim of medical knowledge.

Now that the medical degree is only earned in this country after a thorough education and training, the non-medically educated manipulating practitioner desiring to give to his work a cloak of learning, calls himself a chiropractor or an osteopath.

Judging from the testimony of contemporary English medical writers, much of the work of the bone-setter was of service. He was at least honest in the claim of his title. The form of manipulative treatment known as osteopathy has no relation to the English practice of bone setting, and apparently originated independently. It claims, however, to replace partially dislocated bones and in this way to cure many affections formerly treated by bone-setters.

The extravagant claims made for success and the evidence of lack of anatomical, physiological and pathological knowledge shown by the proficients of osteopathy, justified at the outset an unfavorable opinion of the new art in the minds of trained physicians.

An attempt to cure bronchitis or pneumonia by an osteopathic hug, replacing a dislocated rib, pressing on a nerve, does not commend itself as rational treatment in the minds of educated physicians. But a practice which has been accepted in many communities to the extent of recognition in some states as an authorized method of treatment, must have some reason for its existence and acceptance other than novelty. Homeopathy, the delusion denounced by the past medical generation was justified by the crude therapeutics of the regular medical practitioners of the day. The public preferred to be drugged agreeably, to be given either no medicine or to receive it in agreeable rather than in nauseous doses, when the resulting benefit was apparently no better from the latter treatment. The sick man cares little for scientific theory if his mental or physical comfort is improved by his doctor. In the days of polypharmacy, homeopathy flourished. Perhaps the vogue of osteopathy may be, in part, due to a tendency to polysurgery, *i.e.*, excessive operation. A sufferer from rheumatic pains may naturally prefer to be manipulated by non-mutilating methods than to have all his teeth extracted or his tonsils removed. Exploratory laparotomies may be rarely fatal and often lead to precision in diagnosis, but are sometimes found to have been unnecessary and to be avoided.

Dr. Sayre, the pioneer American orthopedic surgeon, frequently said that a study of the pathology of the joint ligaments was needed as a guide for the better treatment of many of the joint affections. In fact, too little is known not only of the pathology of ligamentous tissue, but also of the normal histological changes, under strain, of action in fascial and periarticular tissue. Ligaments vary in their elasticity, as they are or are not properly used, in the same manner as is true of muscular tissue.

It is known that joints kept unused for some time by fixating appliance become stiffened. There may even be a loss of elasticity of the joint ligaments which may result in a practical ankylosis if joints are kept stiff for a prolonged period. It is probable that under compression and prolonged rest there is an atrophy of ligamentous and fascial tissue and perhaps also a degenerative change with an increase of the fibrous rather than the elastic elements. It is certainly true that on training and practice, an increased suppleness of the joint may be developed, probably from added elasticity of the periarticular and ligamentous tissues as well as of relaxing ability of checking muscles. A corresponding increase of blood flow occurs in ligamentous, as in muscular tissue under exercise. Joint tissue needs function for healthy condition, otherwise degeneration may take place. Muscular tissue needs exercise; if disused it atrophies. Ligamentous tissue and fasciae similarly need the strain of use to prevent degenerative weakening.

The surgical profession of the last generation practised under the belief that a painful joint always needed rest. Experience has shown that there are important exceptions to this rule of practice, which, correct in the acute stages of joint troubles, is unsound after convalescence has been established. In the stage of recovery it is a truth that the joint needs function. Massage and electricity alone, though beneficial, are not sufficient as therapeutic measures in badly stiffened periarticular tissues, nor will simply the exercise of muscle suffice to restore normal conditions. It must always be remembered that the arc of normal motion in most joints exceed those of ordinary motion, and that a joint which may move within a certain distance without discomfort will suffer strain on some of the periarticular ligaments if the arc of motion is increased over that ordinarily used. The same is true of other ligamentous tissue, broad fasciae or inter-muscular fascial fibres and bands.

Strains may occur following exertion formerly harmless, but which have become injurious from tissue changes in muscles or ligaments. In many instances the strain is slight and at first hardly noticed, but later giving rise to pain on movements. This condition is often attributed to other causes than a slight strain and may be regarded as rheumatic. It is evident that where this condition exists, fixation of the joint, though protecting the joint from further strain, and temporarily needed where the pain is severe, cannot be a curative principle of treatment. The ligamentous tissue must be protected from further degeneration by what may be termed protected use. Simply moving a limb is not sufficient. It must be moved in such a way as to bring sufficient strain and not too much upon the affected and not normal ligaments.

There are many ways in which therapeutic ligament and fascia stretching has been attempted; in some instances without a precise understanding of what was done, but with the belief that "movement" cure is helpful. Mecanical, passive and aided active motion in various forms from complicated electric-driven to pendulum-swing weight and pulley devices are in use in institution treatment. Manipulators, more or less specially skilled by experience or training, have in all communities, even primitive ones, practised what might be termed "chiropraxy" (if an unusual and learned name is desired) for it is through the practise of the hand that help is to be given. A third method is through the daily exercise of special movements of the individual, as is the practice among circus performers and contortionists as well as in ballet schools. It is undoubted that beneficial results may be gained by any of these methods properly applied and in suitable cases, nor is there a doubt that such exercises are more commonly needed than is generally supposed. It is easy to demonstrate how common is articular ligament and fascia stiffness even in healthy individuals.

If a middle-aged person of sedentary habits is placed sitting upon the floor and directed to stand without helping himself with his hands, as can readily be done by active children, the difficulty shown in his attempt to get on his feet is due not so much to a lack of muscular strength as a lack of suppleness in his knee, hip and lumbar region, *i.e.*, to diminished elasticity in the periarticular ligaments, fasciae and fascia-like attachments of the large muscles.

In the shoe-bound foot, ligament stiffness is even more evident. In the normal foot, as in the hands, the digits are freely flexible. If anyone who has always worn snugly fitting shoes is asked to pick up a handkerchief with his foot, the ligament stiffness of the metatarso-phalangeal joints will be evident. There is little or no toe clutch found in a shoe-weakened foot, although always present in a normal foot. There is ample evidence to demonstrate the fact that stiffened ligaments can be brought back to a surprising degree of flexibility by persistence and judicious treatment in a much larger number of cases than might at first be supposed, in the same way that muscles may be strengthened by proper gymnastic exercises.

If surgeons are apt to overlook the advantage of non-operative treatment in stiffened joints of the extremities, this is even more true in the stiffened articulation of the spinal column (including the costo vertebral articulation) and of the diminished elasticity in the ligaments and tendon attachments of the large back muscles joined to the pelvis and in the broad fascia in the lumbar sacral region as well as the small tendons of the multifidus spinae.

To manipulate the joints of the extremities and to stimulate the circulation in the superficial tissues is much less difficult than to make the same attempt in the back; but the need of physical therapeutics of the spine and its adnexa is often great and unrecognized by the patient. The individual knows if he walks lame, but diminished flexibility in the spinal column may exist to a marked degree without any knowledge on the part of the patient until a misstep or wrench may strain a stiffened ligament causing a congestion made manifest by lumbago, irritating the emerging nerves and inducing sciatic pains.

The normal flexibility of the spinal column varies and it is desirable as well as not difficult for a surgeon to determine, by observation, a practical standard of a state of adequate flexibility in the various directions of flexion, extension, rotation and side bending of the different parts of the spine suited to the working needs of the individual. Measures for correction of stiffened ligaments of the back in the way of passive and active movements are easily employed on the same principles as those of benefit in stiffened joints of the extremities. These measures can neither be those requiring the use of mechanical aids of service in institutions, or by means of more or less forcible passive exercises conducted by an attendant, bending, twisting, extending and pulling upon the spinal column, the spinal muscles being relaxed, or by active ligament stretching exercises daily conducted by the individual himself. These statements are not to be taken to imply that massage, heat and cold or muscular exercises are not of great value. It must, however, be recognized that these are not the only measures which can be employed in stiffened conditions where operative interference is inadvisable. Stimulation of the circulation promoting absorption in edematous tissue, feeding with additional blood supply tissues which are starved for lack of the normal blood flow by vigorous exercise is of the greatest importance, but stiffened ligaments need the exercise of judiciously applied strain for a proper restoration to function.

The practice of physical therapeutics requires, like other practice, the exercise of judgment and knowledge and experience, but there is nothing not easily comprehended by any well-trained physician. Compared with the preparation needed by the oculist, aurist, laryngologist, teaching in physical therapeutics is simple, but it is of great importance that all surgeons, especially those interested in correction of deformities, should be adequately instructed in this neglected, though useful, branch of remedial agencies. It would not be difficult to mention instances of mistakes made by non-medically educated manipulators who apply manual treatment in cases where such treatment is not suitable. This, however, is unnecessary in discussing the subject among physicians whose daily practice brings them in contact with cases of unrecognized malignant diseases treated by manipulators beyond the period of successful cure by operative measures. Cases of tuberculous spine twisted and forcibly manipulated with resultant serious injury; phthisis and pneumonia treated too long in the expectation of relief from removal of pressure upon a supposed nerve by a supposed dislocated rib. These instances are serious but should not be used by physicians as a justification of the neglect of proper physical therapeutics when such measures are of use. The following instance is an illustration. A young lady, a student at a girls' college, sprained her ankle, which was fixed in a plaster bandage before she returned to her home. The attending surgeon told her to inform her family physician of the condition and advised her that as long as there was pain and swelling fixation would be needed. After a few weeks the bandage was removed by the family physician who re-applied the fixed dressing as pain and swelling followed the free use of the foot. The patient then went to a southern resort to improve her general condition, when removal of the plaster again brought discomfort and a third plaster bandage was applied. By this time several months' confinment of the limb had caused a marked muscular atrophy and increased ankle weakness, a brace was applied and the prolonged use of crutches. Massage and electricity did not restore the ankle to a normal condition and the patient remained, on her return to her college work in the following year, in a partly crippled condition, needing a brace and cane. Meeting with another fall, she suffered a similar severe strain in her other ankle, which was treated by a plaster bandage for some time. Locomotion was given up and the patient resigned herself for the following six months to a wheel-chair life. Massage alone proved inadequate. Persistent muscle training with special attention to the gradually increasing daily exercise of the toe flexors and tibials was necessary to place the patient upon her feet with the reëstablishment of the function of walking. Although there was no impairment of innervation, merely a loss of strength in muscles disused and compressed for a long period, from a month to six weeks' treatment was needed before a satisfactory result was reached. The case was one in which the permanency of the cure could be ascertained in subsequent years. The patient as a housekeeper, a mother of several children or in social activity had no further trouble in her feet and ankles, although in the many years she was occasionally seen, she was of the delicate nervous type. She had, however, needlessly, through unwise surgical treatment, lost a year of her youth.

A healthy woman of sixty-five, having wrenched her knee, was treated for the resulting synovitis by tight bandaging of the knee, which was continued for months, as swelling returned on leaving off the bandage. After a bandage had been worn on the knee for over a year, the other knee was strained and for this similar treatment was applied. At the end of three months the patient finding herself seriously crippled, concluded that some change in treatment might be necessary. Muscle training, massage, electricity persistently employed for a few weeks effected a cure which, as was ascertained by reports in subsequent years, was permanent.

A healthy man of fifty years reported for advice on account of an injured knee, stating that while playing football when in college he had sustained an injury for which he was treated for a long time by means of a "ham splint" and a stiff liquid glass bandage worn for a long period. In the succeeding thirty years he had worn a tight bandage about the knee. If this were removed discomfort followed. On examination, no fluid was found in the joint, the motion was smooth and free, but the thigh above the knee was reduced to less than one-half of its normal size. There was no evidence of injury of the ligaments or cartilages. As the case was seen in the days before x-rays were used in examination, the outline of the bones could not be ascertained, but as there was no limitation of motion or pain, the difficulty appeared clearly to be due to an atrophied muscular condition from too prolonged bandaging. The patient needed a cane, and considered himself a permanent sufferer from rough college sport. Declining any attempt at treatment to strengthen his muscles, having been discouraged by previous massage and electrical treatment, and not knowing how badly he had been surgically advised, he resigned himself to his lameness as a victim of sport.

The practice of the long-continued use of stiff plaster, leather or stiffened steel corsets for back pains is a common one. Tightly girdling the pelvis for supposed partial bone displacement or pelvic bones for joint laxity for lumbar and thigh pain, can manifestly not be continued indefinitely without tissue injury. Cases where much damage is done by ignoring the need of muscle and ligament function for the reëstablishment of a normal condition are not uncommon. They can give to the osteopathic practitioner an impression that the surgeon may lack experience in many forms of backache which can be cured without splints.

There can be no question that the physical therapeutics should be sensibly practical as a part of surgical treatment. If this is done the public will be helped and the service of scientific surgery increased. In these days of sound reasoning from knowledge founded on carefully observed facts the public should not be deluded by "pathies." The practising osteopath, if properly informed, would naturally wish to avoid the name he is labeled with. It is, however, equally true that no sensible physician can ignore the evident benefit to be obtained in suitable cases by treatment which vitalizes tissues weakened by disease, by the rational means of training to function.

Manipulators, under whatever name as a trade-mark they practice and whatever successful results they obtain, must recognize the need of sound fundamental medical knowledge in the treatment of diseased conditions, rather than a reliance upon an empirically trained skill.

The following incident will serve as an illustration: A gentleman mentioned to his family physician that a newly bought and valuable polo pony was to be "fired" in his joint as he had gone lame. The physician asked what benefit was expected to result from such a remedy and was told that the jockey had reported that if ridden half a mile the pony would go lame and that treatment was necessary. The physician suggested that the jockey walk the pony five minutes several times a day, giving his joints use without strain and increasing the time of use daily. The pony was restored to a normal condition in a few weeks. What the result would have been if the joint had been cauterized may be conjectured.

It is natural that the medical profession should regard irregular methods of practice with some suspicion, for there is much ignorant error in medical matters which is injurious, but to regard the unacademic with contempt is irrational as well as narrow; successful popular remedies may contain a grain of truth. Homeopathy meant that the medical profession should avoid heavy, nauseous, and needless drugging. Christian Science indicates that psychology and a knowledge of the working of subconscious thought is needed in medical practice. The catarrh cures preceded laryngology, cancer cures without the knife pointed the need of cancer research and radium study. A prevalence of osteopathy and bone-setting means a need of a more scientific study of physical therapeutics.

## Original Articles.

### PRIMARY SYPHILIS.*

By C. Guy Lane, M.D., Boston,

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The subject of primary syphilis affords an opportunity to emphasize one of the big questions arising in the field of preventive medicine in connection with this disease. The matter of prevention in all its aspects is a subject of first importance, and next in importance comes the early recognition and the care of the early stages in order to prevent later effects. As an introduction to this discussion of the earliest stage of syphilis, it is my intention to emphasize certain modern concepts of this disease as a whole.

In the first place, let me call attention to the concept of syphilis as a general disease, in order to emphasize the fact that it should be treated as such instead of treating merely the local manifestations. In dispensary practice, as well as in private practice, physicians working much with syphilis find that this fact is often lost sight of. Many cases are seen in which the treatment has been continued only until the local condition has disappeared. Certain facts about syphilis contribute to this error. The disease begins as a sharply localized lesion. It appears later in life, often involving a single portion of the body, as a gumma—as a periostitis — aortitis — keratitis, etc. These evidences tend to make us neglect the consideration of this third great plague as a generalized disease. We tend to forget that it is a septicemia, or rather, a bacteremia, at a very early stage in the disease, and that the causative organisms are carried to every nook and cranny in the body, with the ability to lie dormant for many years unless entirely eradicated by rational and long continued general treatment.

Experimental work by Neisser, in 1911, showed that it was possible to transfer the infection by means of the blood before the appearance of secondary symptoms. The failure of circumcision in the prevention of secondary symptoms has demonstrated the same fact. Still more recent is the evidence presented by a positive Wassermann before the appearance of secondary symptoms. The early invasion of the central nervous system, as Fordyce and others have shown by the early positive Wassermann tests obtained on the spinal fluid, is still further evidence of the early infection of the deeper structures of the body. Within the last year or two, at the Rockefeller Institute,[1] experimental work with rabbits has demonstrated that in seven days after the local inoculation of spirochetes into the testicles of a rabbit the presence of spirochetes in the blood has been shown, and this in view of the fact that the primary appears at the site of inoculation in the rabbit clinically twelve to fourteen days after inoculation, much the same as in man. Moreover, in other experiments on rabbits, if the inguinal glands are removed forty-eight hours after inoculation of the testicles with spirochetes, and material from these glands injected into other rabbits, the disease will be produced almost constantly. Thus can be seen the early invasion of the blood stream and the reason for the failure of excision of the primary lesion. The conditions are not exactly the same, of course, but there is no reason to doubt, in view of all the experimental work which has been done, that the course of the disease is much the same in the two species.

Another concept which has been brought to our attention, mostly through the efforts of the Public Health Service and the various state health departments, is the seriousness of the ravages of this disease. Here again the true state of affairs is rather masked. Let me cite an example from our own state. Downing[2] has analyzed the vital statistics for this state for 1912. The records show that only 113 deaths are recorded as due to syphilis. He points out, however, that if one considers still births, paresis, tabes, paralysis without cause, softening of the brain, certain cerebral hemorrhages, particularly between twenty and fifty; certain heart and arterial diseases, certain liver diseases, some of the suicides, etc., there are, in round numbers, probably 3,000 deaths, or one in eighteen, from the effects of this disease. This ranks next to tuberculosis, pneumonia, and cancer as causes of deaths. Vedder estimates that almost one-half of all syphilitics eventually succumb as a result of the infection. It is the greatest cause of death of men in the large cities.

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* Read before the New Bedford Medical Society, Oct. 11, 1920.

In the third place, it is practically impossible to estimate the morbidity and economic loss from syphilis. I know of no way to emphasize properly this conception of the disease. There are so many factors which enter into this phase of the question that only a few can be named: the time lost from work, the lessened efficiency, the expense of doctors and medicine, maintenance of hospitals and dispensaries for their care, the cost of state aid and care, etc., to say nothing of actual suffering and disturbed family affairs. In our own state, according to Williams,[3] it cost $40,000 for 100 men admitted to the Boston State Hospital for syphilitic mental disease, and about 10 per cent. of all cases admitted are syphilitic. It costs a big sum, if one figures it all out. This concept can be emphasized again by calling attention to the fact that there are probably, on a conservative estimate, more syphilitics in the United States[4] than there are people in the New England States, or, that their number is twice as great as the population of our own State of Massachusetts.

The cause of syphilis, the treponema pallida, was discovered by Schaudinn and Hoffmann in 1905, while attempting to prove or disprove the existence of a parasite previously advanced as the causative factor. The organism is spiral, corkscrew-like, with very delicate and perfect spirals. It is very actively mobile, advancing with a screw-like motion, and at other times exhibiting quick lashing motions in which the two ends are approximated. The individuals vary in length roughly from the diameter of a red blood corpuscle to twice this length. It can be grown in pure culture, produce the same disease when inoculated into animals, and be recovered in pure culture, thus fulfilling Koch's law. The earlier experimental work was in apes and monkeys, but the more recent contributions to our knowledge of the disease are due to the work with rabbits. Fortunately for the human race, the treponema is not very resistant. It dies very quickly with drying. It does not curl up in the dust or lie about in the corners as does the T.B. bacillus. If kept moist at body temperature, it may live for twenty-four hours, and in tissue it may live for forty-eight hours, and in undisturbed culture, under proper conditions, it may live for one year. It is very susceptible to antiseptics and is killed by 60 degrees Centigrade for five minutes. No spores have been found and it is thought that reproduction takes place by transverse division. Experiments have shown that its resistance to mercury and arsphenamine can be raised, especially its resistance to mercury. This bears out certain clinical evidence that we have to deal at times with a mercury resistant or an arsphenamine resistant type of organism. Further experimental work indicates that there are certain strains of treponema just as there are strains of streptococci. Nichols[5] has isolated a strain which has produced neurosyphilis in man and consistently produced choroiditis in rabbits. This fact is demonstrated again in the individuals who have only skin lesions, bone lesions, or nerve lesions without other manifestations, and also in the families in which there are several paretics. It is not yet possible, however, to prophesy, from a study of a treponema or a primary lesion, the type of disease which is apt to follow.

The primary lesion of syphilis, or chancre. appears about three or four weeks after infection. It may appear earlier, or as late as six weeks after inoculation. The term "hard" and "soft," as applied to chancre, ought not to be used. It is far more preferable to use the correct terms, chancre and chancroid. About 92 per cent.[6] of the initial sores are on the genitals, the other 8 per cent. being scattered over the rest of the body, most frequently on the lips, tongue, throat, and breasts. The contagiousness of these sores is illustrated by the famous kissing party reported by Schamberg,[7] in which eight individuals were infected by a chancre of the lip. The typical primary lesion has certain definite characteristics. It is usually a painless lesion. It is indurated, the induration at times being almost cartilaginous in character. It is essentially a papule, dull red in color, sometimes crusted, eroded, or ulcer ated, with comparatively little discharge. It may vary much in size and may be single or multiple. Numerous classifications of types of primary lesions are found in textbooks, but the various types usually have certain essential characteristics, as I have said, these characteristics being modified somewhat with the location, and particularly, with the amount and character of the mixed infection. Another characteristic is the involvement of the neighboring glands. Within two or three weeks these satellite glands become enlarged and hard, but are not particularly painful. The clinical recognition of a typical untreated primary lesion is not difficult. In regard to the mixed infections, in the lesions which have been treated, and in extragenital lesions, a diagnosis may often be impossible clinically.

I shall purposely say very little about the clinical differential diagnosis, for I feel that laboratory methods play such an important part in and should be applied to the diagnosis of questionable lesions. A chancroid, even a frankly chancroidal ulcer, ought to be considered as a possible hiding place of treponema, and should be examined with that possibility in mind until such time as the diagnosis of syphilis can positively be disposed of. These ulcers are usually excavated, with undermined edges, are painful, with glands which tend to suppurate, and have a short incubation period. Scabies is characterized by itching, other lesions on the body, and often the typical burrows. I have seen a few cases in which the only lesions were on the penis. Herpes is usually a group of vesicles with some itching or burning, without glandular involvement. A carcinoma appears late in life, develops slowly, is often painful, and may have a pearly border. A late syphilitic ulcer is a slow-growing, sluggish, infected one. It does not usually show the characteristic enlargement of the inguinal glands and may have a history of previous syphilis. In all these diseases, in fact, in any sort of sore on the genitals, the possibility of early syphilis must be considered. Not only that, but in the knowledge of the fact that there are 8 per cent. which are elsewhere on the body, the same consideration must be given to all sluggish ulcerations and slow-healing abrasions and fissures, particularly with a painless enlargement of the nearby glands. Again let me repeat two lessons which should be learned: Any lesion of the genitals may be the abiding place of the preponema pallida; and secondly, it is impossible to make a positive diagnosis in many cases from the clinical appearance alone.

It is in order to avoid the later consequences of syphilis, which I have mentioned in my introduction, that I want to lay so much stress on the fact that these cases should be sumbitted to laboratory tests—to a dark-field examination at the earliest possible moment, and in an untreated condition. Let me dwell on this latter point. The cauterization of penile lesions and their treatment with antiseptics before a darkfield is done, that is, before an attempt has been made to ascertain the presence of the organisms of syphilis, is a serious error. It may destroy the chance of making a positive diagnosis of syphilis until the disease has become widespread enough to provoke a serological change. It may deprive the individual of the advantage of treatment at the most favorable moment. It may allow him to continue in an infectious condition with the possibility of infecting others. It is far more important that an early syphilis be detected than that a chancroid or a herpes should go untreated for twenty-four to forty-eight hours. The former is a generalized disease with far-reaching and late effects, while the latter are localized diseases of comparatively short duration. Therefore, don't cauterize, don't treat with calomel or blchloride or strong antiseptics until a darkfield has been made. And if such application has been made, use a normal salt solution dressing for twenty-four to forty-eight hours and make another examination at the end of that time. The darkfield bears the same relation to syphilis that the culture does to diphtheria, only with the darkfield one has the opportunity to see the actual, living, moving cause of the disease in question. In the use of the darkfield as a diagnostic measure for syphilis in the early stages, and in thus paving the way for prevention of the latter stages by proper treatment, we make a practical and effective contribution to preventive medicine.

There are certain details in the darkfield technic which tend to simplify the process so that I feel it is worth while to review the method of making this examination. I have emphasized its value and I might add that it is worth even more to us in the matter of diagnosis than the examination of sputum in suspected tuberculosis. The special equipment necessary consists of the darkfield stage and a source of strong light. A hard rubber "funnel stop" is necessary for insertion into the oil immersion lens if this is to be used. Thin slides and cover glasses should also be used. As a matter of fact, a piece of blotter the size of a quarter, attached to the under side of an ordinary Abbé condenser, gives a very satisfactory darkfield. A 150-candlepower, nitrogen lamp, enclosed in an asbestos-lined or metal-lined box, is necessary to produce sufficient light. The most satisfactory lamps, naturally, are those sold by regular instrument makers, such as the Bausch & Lomb, and the Leitz.

In the matter of obtaining specimens for examination, attention to certain details increases the chances of finding the organisms, if present. I have mentioned the necessity of obtaining specimens from untreated lesions, if possible. The first step which will aid us is to wash off the surface with 95 per cent. alcohol, rubbing vigorously enough to cause a slight oozing If the lesion is covered with epithelium, it should be scarified with a scalpel. Mop off once or twice with dry gauze to get rid of the excess blood. Experience has shown that pressure tends to force more treponema to the surface and thus into the serum. Have the individual squeeze the lesion at the base as hard as possible without causing too much pain. It is very necessary that the microscope be centered by means of the circles on top of the darkfield condenser, that is, these circles should be in the center of the microscopic field when viewed with the low power lens. Furthermore, it is necessary that a drop of oil be placed on the top of the condenser, sufficient to fill in the space between it and the under surface of the slide, and also that a drop of oil be placed on the surface of the cover glass if the oil immersion lens is to be used. I prefer to use the oil immersion, but the high dry lens gives sufficient magnification to make a diagnosis. We hear considerable discussion about various treponema which may be found by this method. In genital lesions it ought to be fairly easy to distinguish between the treponema pallida and the treponema refrigens. The latter organism is shorter, thicker, with smaller and less regular turns, and has not the same characteristic motion of the pallida. In the mouth lesions, there is more difficulty. Diagnosis from microscopic evidence alone should be made with hesitation. The surface of mucous lesions must be cleansed thoroughly and an endeavor made to obtain material from beneath the surface, in order to avoid contamination with similar organisms found in the mouth.

In the cases which are positive it is needless to say that treatment should be started at once. In the negative ones, further examinations, repeated as the individual circumstances suggest, should be made, using salt solution, as I have indicated before. Such cases should be watched and blood taken for Wassermann examination at the time of the first examination, and again in two to four weeks, or sooner if necessary, in an endeavor to settle the question of syphilitic infection once for all. As I say, it is imperative that this question of syphilis, or not syphilis, be determined at the earliest possible moment in order to give the individual and society every possible advantage of preventing the full development of a serious contagious disease. I believe that a procedure similar to this should be followed in every case of genital lesions, or other suspicious lesions, the details, of course, varying somewhat with the indications in the individual case.

There are other laboratory methods to aid us in the diagnosis of early cases. A very practical aid to the darkfield examination is the puncture, with a sterile hypodermic needle, of a satellite gland or the indurated base of a suspicious lesion. Gentle motion of the syringe, while the needle is within the gland substance, either with or without the injection of a tiny amount of sterile salt solution, will result in the maceration of a certain amount of tissue so that perhaps some cloudy fluid may be drawn up into the needle. This material, expressed on a slide and examined under the darkfield, may show the characteristic spiral organisms and aid in the definite determination of those lesions in which a darkfield examination of the surface is negative.

The serological test, the Wassermann test, does not help us in the first few days, but does stand in the second line of attack, as it were. A positive result is given in about 60 per cent. of the cases within three weeks of the appearance of the primary. This fact emphasizes still more the value of an early darkfield examination as a means of diagnosis before serological change is evident. The value of a single positive Wassermann is often exaggerated. Standing alone, with no other evidence, it needs confirmation. In the presence of suspicious signs or symptoms, it becomes a valuable ally in diagnosis. The correct interpretation of results demands a knowledge of the particular laboratory and the sensitiveness of the technic which is being used. The general reliability of the technic in this state has been shown recently in 3000 cases by comparison of serological tests performed in two different laboratories in Boston.[8] This series has demonstrated a uniformity of results in the two laboratories in over 96 per cent. of the cases on one test. In the great majority of the small number showing different results, later tests showed agreement.

A third method of laboratory diagnosis in early lesions is by culture. Granting that a darkfield is negative, recent reports indicate that it is possible, in properly equipped laboratories, to excise a piece of tissue, plant on a proper media, and recover the organism in twenty-four to forty-eight hours. Suffice it to say that this method is hardly to be used except in the vicinity of especially equipped laboratories. In all our work of diagnosis, laboratory as well as clinical, we must be guided by reason and judgment, perhaps having an outline or routine to be followed, varying it to fit the individual case under consideration, the main point being, as I have already stated, to settle the diagnosis of syphilis as soon as possible. It is not necessary, however, to carry our zest for laboratory procedure to the extent described in a case reported by Dr. Pusey of Chicago, of a boy who had had numerous Wassermanns and darkfields, two spinal punctures, a circumcision, and a biopsy, in an attempt to make a diagnosis of syphilis in a case of herpes progenitalis.

In the prognosis of early syphilis, there is abundant reason to believe that our newer methods of treatment will afford to the individual an absolute cure. Indications are that treatment instituted early in the disease, before the treponema have become widely disseminated in large numbers, will kill off these organisms and prevent them from settling down in those areas in which they are accustomed to localize in the later stages. I believe that early, persistent treatment of these earlier cases practically guarantees the individual from further consequences of this infection.

In the local treatment, the use of calomel ointment or calomel powder is usually sufficient, in addition to the usual regular treatment, which should be started as soon as the diagnosis is made. Let me emphasize the fact that treatment should not be instituted until a diagnosis is positively made. Tentative treatment, or incomplete treatment, may spoil the possibility of making a diagnosis at a very early stage, but, at the same time, no delay should be made in beginning treatment at the earliest possible moment when the diagnosis is certain. In early syphilis, we are confronted with a disease which has the actual living organisms circulating in the blood stream. With this indication for treatment before us, the necessity is seen at once for the introduction of those agencies which will kill off the organisms as quickly as possible with the least damage to human structures. The most powerful spirillicide which we have is arsphenamine, the drug which experimental and clinical experience has shown performs this work to the most satisfactory degree that is known at the present time. This drug should be administered intravenously, according to the careful directions which accompany each dose of the drug. Too much attention to detail cannot be given to the preparation of the solution, and to the administration. It is necessary that distilled water, and freshly distilled water, be used, and that water of proper temperature should be used, according to the brand of drug employed. The matter of neutralization exactly according to directions, the matter of filtration, the matter of proper tubing, the matter of speed with which the drug is administered, all are matters to be given the utmost consideration. The necessity for perfect sterilization of utensils and the fact that we are dealing with a toxic drug, are factors which should always be borne in mind. It is through the neglect of details in mixing and neutralizing and administering the drug that so many serious mishaps and accidents have arisen. In the administration of arsphenamine the most satisfactory results, in the long run, are obtained by the use of the gravity method, employing a dilution of 0.1 gram to at least 20 c.c. sterile water, using an 18 to 20 gauge needle. A Fordyce needle, or the use of some similar adapter, tends to make the actual insertion of the needle into the vein a much easier process. Let me emphasize again the necessity for care both in the preparation of the solution and in its administration, in order to avoid the possibility of undesired effects. The preparations produced in this country today are, as a whole, less toxic than foreign preparations, and are giving reliable results in the hands of the majority of the men who are using them.

Individuals who are to receive salvarsan should receive a certain amount of preparation. In the first place, they should have a physical examination before treatment. We ought to know their physical condition before, in order to estimate the dose and frequency of the drug, and to be able to anticipate possible serious effects. The urine should be examined; the circulatory system should be examined; and the blood pressure taken, particularly in individuals over forty. History of previous diseases, particularly in regard to the kidney, heart and liver, should be obtained. The patient should be requested not to eat for at least four hours before the injection and to take a saline laxative, preferably the night following. Both of these measures tend to lessen the possibility of reactions.

There are two usual methods of prescribing arsphenamine. The first includes six or eight weekly, intravenous injections, in doses calculated to the body weight of the individual, giving 0.1 gram for each thirty pounds of body weight. The first injection of a series should not be larger than one-half the dose for that individual in order to avoid the possibility of an idiosyncrasy to arsenic. The other method of treatment, the so-called intensive method, consists of three full doses of arsphenamine at twenty-four hour intervals, the intention being to eradicate all the treponema at this time, if possible. Pollitzer of New York is the champion of this method, and his results tend to bear out his contention. It must be remembered, however, that he is a man of wide experience and uses the utmost care in the preparation and administration of the drug. I, personally, favor a half-way course, particularly in the type of ambulatory cases which we see in the dispensaries and in the office. I feel that an intravenous injection, calculated as above, every three days, for four doses, followed by two to four more at weekly intervals, provides almost as much assurance in the way of treatment, and at the same time is a bit safer to employ with the average individual.

Mercury is indicated in every case. It may be given during the period of administration of arsphenamine. It should be administered to the toleration of the individual over a period of ten to twelve weeks, always remembering the fact that mercury is more toxic to the kidneys than arsphenamine. The injection of a soluble salt every other day, or the injection of an insoluble salt, such as the salicylate, intramuscularly, once a week, are the methods most in use today. The inunction method is slower and dirtier, but at the same time the saturation can be maintained in one to whom the other methods are objectionable. I repeat that in our eagerness to treat properly we should not lose sight of the fact that both arsphenamine and mercury are toxic drugs; that they both cause irritation to kidney epithelium particularly. Careful examination of urine should be made at frequent intervals, and careful note should be taken of any untoward circumstances arising after treatment, in order to prevent possible bad results. One should be on the watch for early immediate reactions occurring during or just after administration—the type which causes flushing of the face, possible dyspnea, backache, substernal depression, etc. One should be on the watch for cases in which nausea, vomiting, headache, etc., occur for twenty-four to forty-eight hours after several injections. One should be on the watch for later effects, that is, for the beginning of a dermatitis, which may possibly lead to the serious exfoliative type; for a possible beginning jaundice; for a possible polyneuritis; as well as the possible irritation of the kidney during the course of treatment.

After the first course of treatment with arsphenamine and mercury, lasting, as I have said, from ten to twelve weeks, a rest of four to six weeks may come before repeating the same course again. If the Wassermann remains negative during all this period it may be possible to omit a third course of salvarsan; but I believe, at the present day, in the light of experience to date, it is safer for the individual to have his third course of arsphenamine and mercury in order to be sure of being totally free from the disease. It is not possible to treat the disease properly without the use of both drugs. Practically every authority agrees on this point, the main difference coming in their method of use.

Neoarsphenamine as a substitute for arsphenamine is being used much more extensively. The fact that it dissolves readily in cold water, that it does not require neutralization, and that it is less apt to produce reactions, makes it attractive for administration. Neoarsphenamine solutions are toxic when the drug dissolves with difficulty, or when cloudy solutions are employed, or if shaken in the presence of air. It does not hemolyze the red blood cells in the ordinary concentrations. It is, however, less active therapeutically than arsphenamine, and the clinical experience of most authorities favors the use of the latter. The concensus of opinion is that neoarsphenamine when used as a substitute, should be administered oftener or for a longer period to obtain the same therapeutic effect. In early cases of syphilis, Schamberg[9] commonly administers 0.9 gram three times a week.

In conclusion, I might summarize by saying, that we are dealing with a contagious disease which becomes generalized at a very early period. It has most serious effects on the individual and on society. Proper laboratory facilities are essential for the diagnosis of early syphilis. In the eradication of the disease, our share, as physicians, lies in the furtherance of efforts at prevention, in the recognition of early stages, and in rational, persistent treatment, in order to prevent the disastrous effects of later involvement and of infection of others.

REFERENCES.

[1] Brown, W. H., and Pearce, Louise: A Note on the Dissemination of Spirochaeta Pallida from the Primary Focus of Infection. Arch. Derm. and Syph., Vol. ii, p. 470, October, 1920.
[2] Downing: Syphilis and Lung Diseases. Boston Medical and Surgical Journal, Vol. clxxii, p. 898, 1915.
[3] Williams, F. E.: Relation of Alcohol and Syphilis to Mental Hygiene. Am. Jour. Pub. Health, Vol. vi, p. 1272, 1916.
[4] Stokes: Third Great Plague. Ed. 1, Philadephia, W. B. Saunders Co., 1917, p. 24.
[5] Nichols: Observations on a Strain of Spirochaeta Pallida Isolated from the Nervous System. Jour. Epx. Med., Vol. xix, p. 362, 1914.
[6] Porter, H. W.: Statistical Study of Extragenital Chancres. Arch. Derm. and Syph., N. S. Vol. l. p. 15, January; 1920.
[7] Schamberg, J. F.: An Epidemic of Chancres of the Lip from Kissing. Jour. A. M. A., Vol. lvii, p. 788, 1911.
[8] Solomon, H. C. Agreement in Results of the Wassermann Reaction Jour. A. M. A., Vol. lxxiv, p. 788, March 20, 1920.
[9] Schamberg, J. F.: Arsphenamine versus Neo-Arsphenamine. Jour. A. M. A., Vol. lxxiii, p. 1883, Dec. 20, 1919.

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# RECTAL ABSCESSES AND THEIR TREATMENT.

By T. Chittenden Hill, M.D., Boston.

The simplicity of the incision of an abscess as a surgical procedure and the frequency with which abscesses in the perianal region are met have led to minimizing the importance of their treatment. Except in relation to their location, it is true that they differ in no important particular from abscesses in other situations. Their location, however, makes the subject an important one for consideration, for every rectal abscess is a potential fistula.

## ETIOLOGY.

Like all other abscesses, rectal abscesses arise from direct introduction of bacteria. This may take place either through the skin of the perianal region, which is very rich in hair follicles and sebaceous glands, or through some lesion within the rectum, such as an ulcer, abrasion, or fissure.

Pathologists tell us, and indeed it is a well-recognized fact, that infective bacteria are present in the superficial layers of the skin all over the body. Bacteriological examination of the anal skin in health shows many varieties of pus-producing organisms, and, as both within and without the rectum they are exceedingly numerous, it naturally follows that the perianal region is a favorite site for abscesses. The question of the most common infective agents, however, has never been settled, as bacteriological studies of the pus are beset with great difficulties and a pure culture of any organism is seldom found. The staphylococcus and streptococcus are commonly present; the B. coli is nearly always found and is the cause of the very foul odor so frequently associated with them. Some infections take place through the blood stream,—notably, those following injuries to the parts and those of a tubercular type.

A primary tubercular abscess is most uncommon, infection being more frequently secondary, gaining entrance through swallowed sputum, or from the pus of a tubercular lesion of the intestinal tract. Even such infections must be comparatively rare, however, as I am told that rectal abscesses are not especially numerous in tuberculosis hospitals. Nevertheless, the question whether abscesses and fistulae are not, as a rule, tubercular in origin is frequently asked. To my mind this tubercular theory, so popular among the profession, has erroneously become the commonly accepted conception through the frequency with which such abscesses result in fistulae through improper treatment.

## TREATMENT.

The rapid burrowing of pus about the muscular structures which control the important function of defecation, if not recognized early and freely drained, may lead to serious results. Inadequate and poorly devised incisions are responsible for much suffering and invariably terminate in rectal fistulae. Indeed, the invalidism and distress which follow the improper treatment of these cases can hardly be overstated. It is a common experience to see patients who have had abscesses and fistulae incised regularly over a period of years without any benefit except a temporary relief of the painful symptoms.

The imperfect technique of incision is largely due to the fact that textbooks on general surgery either give no information as to the type of incision indicated, or, what is more to be regretted, their teachings as to the method of incision are impracticable and wide of the mark. Two of the most popular and latest books cover the subject as follows:

1. "Early incision and drainage constitute the only treatment of this condition. . . . As the majority of these cases are caused by infection from the bowel, *in many instances a fistula results, requiring subsequent treatment.*"

2. "The incision runs from the anal margin like the spokes of a wheel. Irrigate with salt solution, inject iodoform emulsion, insert a drainage tube and *let the patient know he is in danger* of developing a fistula."

This is all there is to be found about the treatment of a practical nature, in either book.

To always warn the patient that this condition may become a fistula, as these authors have suggested, is perhaps safest; on the other hand, I am firmly convinced that if the incisions are carried out as I shall presently describe them, this unhappy result will seldom, if ever, follow. It seems to me that every fistula should be regarded as a reflection on the surgeon's skill and, as these cases now make up nearly 50% of all rectal affections, there is room for much improvement in their present mode of treatment.

The following are some of the reasons for the frequency with which a fistula succeeds an abscess:

1. A very common error is to delay too long in opening the abscess, temporizing with fomentations, etc. The result of such delay is an increase in the size of the abscess with much destruction of the soft areolar tissue and consequent delay in the healing process. Pain and induration are sufficient evidence of abscess formation and one should never wait for fluctuation.

2. A small opening almost invariably means a fistula. It should be remembered that, as the abscess cavity contracts, the incision is also shortened, thus affording poor drainage. The opening should be sufficiently large to remain patent during the after-treatment. It is a very painful procedure to push in gauze through a small incision, as some surgeons do.

3. The form of incision is very important. The T or crucial is best for most abscesses. It will be recalled that even the skin covering the peri-anal region (corrugator ani muscle) has a tendency to close up the wound. When reinforced with the action of the external and internal sphincters, it can readily be understood why an incision "running from the anal margin like the spokes of a wheel," as advocated, is so entirely inadequate in a rectal abscess.

There are several varieties of abscesses in this region and the method of operating varies with the particular form to be dealt with.

*Subcutaneous and Marginal Abscesses.* For the more superficial subcutaneous and marginal abscesses infiltration anesthesia is preferable. They are small in size and show no tendency to burrow. For this reason a procain solution works well. The *subcutaneous abscess* can then be lifted with the thumb and finger and transfixed with a bistuary. A second incision should be made through the deepest part of the induration (crucial incision).

For the *marginal* abscess a T incision is best, as there is less liability of injuring the external sphincter. To render the abscess more prominent the finger should be inserted in the rectum. The first incision is made parallel to the anus in the direction of the muscle fibres, the second at right angles to it. The cavity should then be swabbed out and a moist, sterile wick inserted.

*Submucous Abscess.* This abscess is usually found in the lower three inches of the rectum and lies just under the mucous membrane. It is smooth and elastic to the touch, much like a gum-boil, and is more or less elongated in contour. At defecation it causes acute pain and a feeling of weight and throbbing in the rectum. Apparently this abscess has its origin in the semi-lunar valves of Morgagni at the mucocutaneous juncture, for it is at this level that it often ruptures during digital examination.

This variety, in some instances, especially when felt above the internal sphincter, closely resembles a pelvi-rectal abscess. It bulges into the rectal cavity in much the same manner. I have encountered several such cases in which, even with the patient etherized, the type of abscess was doubtful. How can the two types be differentiated? I know of no absolute rule and have never seen any given. As just remarked, a submucous abscess can generally be made to burst by exerting force with the finger in the rectum. A pelvi-rectal abscess, being outside the muscular wall of the rectum, could not easily be ruptured in this way. This has been the point of differentiation upon which I have chiefly relied. The puncturing of a pelvi-rectal abscess within the rectum would, of course, be a very grave error, resulting certainly in a type of fistula most difficult of cure, and very possibly leading to a septic peritonitis through a diffuse cellulitis of the pelvic-rectal space.

The treatment of the submucous abscess depends upon the stage of its development in which it is discovered. If it has already burst, or is ruptured during the first examination, the opening will be found at its lower margin near one of the crypts of Morgagni. It is not necessary to enlarge the opening, as this variety, in over half of the cases, will heal spontaneously within three or four weeks. If healing does not take place, the abscess should be laid open from end to end by a linear incision on a grooved director. If, after introducing the director, it is found that one of the branches of the superior hemorrhoidal artery will be severed, it is my practice to thread a linen ligature on a silver probe which is passed through the sinus and tied tightly. The linen ligature will cut its way through the overlying mucous membrane in three or four days without any bleeding When met with before the abscess has ruptured, a small T incision should be made at its lowest extremity and enlarged with a pair of forceps. No packing or other dressing is required in this form of abscess. These cases should be kept under observation until soundly healed, for if allowed to become chronic, they frequently cause vague symptoms of discomfort in the rectum, often partially healing, leaving small sinuses which are exceedingly difficult to detect later on.

*Ischio-Rectal Abscess.* This abscess occurs in the soft adipose tissue of the ischio-rectal space, which is poorly nourished with blood vessels. A septic process here spreads rapidly, as a rule, and often this abscess attains in a short time a quite remarkable size. Frequently what appears on examination to be a comparatively small abscess, at operation may be found to be a large one that will take several weeks to heal. The ischio-rectal abscess either breaks through into the rectum posteriorly, or often the pus finds its way back of the rectum to the ischio-rectal fossa of the opposite side. It is this latter form which is responsible for the horse-shoe fistula. In some of these abscesses there is very little external evidence, but, on introducing the finger into the rectum, a good-sized globular swelling can be felt between the finger and the thumb on the outside.

Incision should be made under general anesthesia. Gas-oxygen is a very satisfactory anesthetic, as the operation can be quickly performed. The T-shaped incision is recommended. With the index finger of the left hand in the rectum, the exact limits of the abscess are determined. The knife is then passed into the cavity and the first incision made, which should be a free one, extending from one extremity of the induration to the other and parallel to the anus. A second incision is then made from the centre of the first and all pockets found to exist gently broken down with the finger. Further incisions because of lateral burrowing, unless very extensive, are unnecessary; in fact, it is better practice to avoid excessive mutilation and the neighboring muscular structures should not be damaged at all.

*Pelvi-Rectal Abscess.* This deep abscess has its starting point in the superior pelvi-rectal space, located between the levator ani, which practically surrounds the rectum, and the reflection of the peritoneum above. Abscesses originating here may be caused by inflammatory conditions of the meso-rectum, the broad ligaments in the female, or disease of the prostate, seminal vesicles and bladder in the male. They do not arise so often from lesions of the rectum itself, though they do follow ulceration and traumatic conditions, such as foreign bodies.

In its early stage, diagnosis of this form of abscess may be easily overlooked. In the more chronic cases the symptoms are not very pronounced, in many instances being more of a reflex disturbance with pelvic distress and pain radiating to the lumbar and sacral regions or down the thighs. Digital examination, however, even in the earliest cases, will show a distinct fullness and swelling in the rectum. Later the abscess follows one of three courses: (a) it invades the ischio-rectal space, at this stage rather closely resembling an ischio-rectal abscess; (b) breaks through into the so-called retro-rectal space; or, (c) opens into the iliac fossa, following the line of least resistance and pushing the peritoneum before it. Therefore the importance of always making a digital exploration to ascertain the starting point of the suppuration.

When met with early (before the abscess has burrowed through to the ischio-rectal fossa), the incision is made as follows: a straight bistuary with its back toward the rectum, the finger in the rectum to serve as a guide, is pushed upwards into the abscess cavity until pus begins to flow. The incision is then enlarged parallel to the anus and a careful dissection made down to the levator ani muscle. The incision should be enlarged until the muscle fibres and the opening just made into the superior pelvi-rectal space are plainly visible. The muscle fibres of the levator ani are now cut transversely on both sides so that the opening shall remain thoroughly patent until the cavity above has been completely obliterated. In these deep abscesses I consider this procedure of dividing the levator of the greatest importance, and I first called attention to this method of dealing with them in a paper read before the American Proctologic Society, some ten years ago. The method of enlarging the opening described in special works on proctology is its divulsion with the finger or by means of a pair of dressing forceps passed into the cavity, then widely opened and withdrawn. This procedure simply separates the fibres and they unite before the abscess cavity above has been completely obliterated. This variety of abscess is the cause of the deep anterior horse-shoe fistula, the recto-urethral fistula, and sometimes the much more common posterior horse-shoe fistula, types that require extensive and often mutilating operations for their relief. These unpleasant sequellae can almost invariably be avoided by incising the levator muscle at the time of operation, as just described. The external wound should be converted into a T incision as the last step in the operation.

Further explanation of the manner of dealing with this abscess when it has already involved the ischio-rectal fossa is unnecessary. Whenever incising what appears to be an ischio-rectal abscess the possibility of this kind of an abscess should always be bourne in mind. In all cases where unusual quantities of pus are evacuated its origin will generally be found in the superior pelvi-rectal space. That the source of the infection is often overlooked is evident from the many cases of deep-seated, troublesome fistulae frequently encountered by all proctologists.

*Retro-Rectal Abscess.* This abscess develops in the loose cellular tissue found between the rectum and the hollow of the sacrum, just above the levator ani. The pelvi-rectal abscess often invades this space, or the abscess may originate independently from necrosis of the sacrum, coccyx, ilium, or even the bodies of the vertebrae. Perforations of the rectal wall by sharp foreign bodies, such as a fish-bone or a syringe tip, are said to be a cause. The incision is made posterior to the anus and the fibres of the levator ani divided in a similar manner to that described for the pelvi-rectal abscess. The finger is passed into the cavity and all pockets gently broken down. Tubes for drainage purposes should always be employed, and they should be removed just as quickly as possible, as the wound granulates fast, as a rule. At the same time, one should always ascertain whether there is any connection between the retro-rectal and pelvi-rectal spaces. If such is found to be the case, tubes should be inserted so as to insure free drainage of this space as well.

### AFTER-TREATMENT.

Having afforded ample drainage with good incisions, the after dressings are simplified. There is no advantage in irrigating the abscess, as the pus will drain into the dressings. If gauze is put into the cavity, it should be used sparingly and changed frequently. The word "pack" is responsible for much slow healing and many fistulae. A drainage tube is far better for all deep abscesses.

I am a great believer in the hot sitz bath, night and morning, as carried out at St Mark's, London, and St. Bartholomew's Hospital, New York. It is questionable whether boracic acid or other antiseptics added to the water are of any great value. The water should be boiled and used as hot as the patient can bear with comfort. In all the deeper abscesses the patient should be kept in bed or on a couch until the abscess has almost healed. As granulation proceeds, irregular healing should be prevented by sponging the surface of the wound with a small piece of cotton twisted on the end of a grooved director. This breaks down any bridging and is an important detail in the prevention of fistula formation.

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# THE ENERGY REQUIREMENTS OF GIRLS FROM 12 TO 17 YEARS OF AGE.

By Francis G. Benedict and Mary F. Hendry,
Boston.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

(Continued from page 262.)

*Comparison of Weight for Age.* On the basis of body weight alone it can be seen that all of our groups, with one almost insignificant exception, had higher weights than the weights for similar ages represented by Wood's material. In the group aged 14 years, 1 month, the average weight of our girls was 44.2 kgs., as against an average weight of 44.5 kgs. for the Wood data. On the other hand, the weights of our girls exceed the weights for the Benedict and Talbot private school girls in only two age groups and are somewhat inferior in six groups. The particular age group of 14 years, 1 month is 7.1 kgs. lower (44.2 kgs. as against 51.3 kgs.) than the Benedict and Talbot group, but this fact cannot properly be taken as an index of distinct abnormality, since the average weight of this group is only 0.3 kg lower than the average weight noted on the Wood curve. From an examination of the detailed data in Table III, showing the individual ages, weights and heights, it can be seen that this group included five girls under 41 kgs. in weight, offset in part, it is true, by the unusual weight of subject No. 39, *i.e.*, 62.2 kgs. It is, however, a point worthy of special note, that while we may not consider the girls in this group as physiologically inferior to a normal series of girls, such as that of Wood, they still are characterized by being perceptibly lower in the scale of comparison, *i.e.*, age-weight, with the Benedict and Talbot private school girls than any other of our groups.

Table IV.—Comparison of the Average Weights and Heights of the Groups of Girls Studied with the Standards of Wood[1] and of Benedict and Talbot[1] (Private Schools) for Girls of the Same Ages.

| Average age | | Weight (without clothing) | | | Height | | |
|---|---|---|---|---|---|---|---|
| | | Girl Scouts | Wood standard | Benedict-Talbot (private schools) standard | Girl Scouts | Wood standard | Benedict-Talbot (private schools) standard |
| yrs. | mos. | kgs. | kgs. | kgs. | cms. | cms. | cms. |
| 17 | 0 | 58.1 | 51.3 | 59.4 | 163 | 159 | 163 |
| 15 | 10 | 53.6 | 49.9 | 54.8 | 163 | 157 | 164 |
| 14 | 10 | 49.9 | 47.1 | 54.7 | 160 | 156 | 162 |
| 14 | 1 | 44.2 | 44.5 | 51.3 | 155 | 154 | 162 |
| 14 | 0 | 51.7 | 44.2 | 50.8 | 161 | 154 | 162 |
| 13 | 8 | 50.0 | 41.8 | 49.2 | 159 | 152 | 161 |
| 13 | 4 | 43.7 | 40.0 | 47.5 | 153 | 149 | 159 |
| 12 | 10 | 41.0 | 37.3 | 44.9 | 152 | 146 | 156 |
| 12 | 2 | 39.5 | 35.2 | 41.9 | 150 | 143 | 153 |

*Comparison of Height for Age.* The average heights of our groups of girls are in all cases above the average heights drawn from the Wood curve. When compared with the Benedict and Talbot private school girls, our first group only is up to this standard. All the other groups are somewhat shorter, the greatest difference being observed in the group aged 14 years, 1 month, where the height is 7 cms. shorter than that for the private school girls. Attention should be called to the fact that the group aged 13 years, 4 months, is 6 cms. shorter than the corresponding private school group. In connection with the difference in height shown by the group aged 14 years, 1 month, it should be recalled that this particular group also showed the greatest weight difference when compared with the private school girls.

*Comparison of Weight and Height as an Index of Normality.* In spite of the popular use of the weight-age ratio, the weight-height ratio is physiologically much sounder. In the final consideration of our girls with a view to establishing their normality, therefore, it is necessary to study the relationships between weight and height and compare them with other standard series. For this purpose we will use the same series, namely, those of Wood and of Bene-diet and Talbot for private schools. The data are shown in Table V herewith. In the first part of the table the actual average heights of our girls are compared with the heights obtained for girls in the Wood series and the Benedict-Talbot series at similar average weights. In the second part of the table the actual average weights of our girls are compared on the height basis with the weights for the two standard series. The unavoidable variations in weight and height of the girls in our several Girl Scout groups make such a comparison, at best, open to severe criticism, and yet as a whole it is not without significance in indicating normality.

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[1] Benedict and Talbot, Carnegie Inst. Wash. Pub. No. 302, 1921, pp. 43 and 44. See, also, Gray and Gray, Boston Medical and Surgical Journal, 1917, Vol. clxxvii, p. 894.

Table V.—Relationships between Height and Weight for the Groups of Girls Studied, as Compared with those in the Standard Series of Wood[1] and of Benedict and Talbot[2] (Private Schools) for Girls.

| Average weight (without clothing) | Height |  |  | Average height | Weight (without clothing) |  |  |
|---|---|---|---|---|---|---|---|
|  | Girl Scouts | Wood standard | Benedict-Talbot (private schools) standard |  | Girl Scouts | Wood standard | Benedict-Talbot (private schools) standard |
| kgs. | cms. | cms. | cms. | cms. | kgs. | kgs. | kgs. |
| 58.1 | 163 | --- | 166 | 163 | 58.1 | 52.9 | 53.7 |
| 53.6 | 163 | 164 | 163 | 163 | 53.6 | 52.6 | 53.0 |
| 49.9 | 160 | 159 | 161 | 161 | 51.7 | 51.0 | 49.4 |
| 44.2 | 155 | 152 | 157 | 160 | 49.9 | 51.0 | 49.2 |
| 51.7 | 161 | 161 | 162 | 159 | 50.0 | 50.0 | 47.0 |
| 50.0 | 159 | 159 | 161 | 156 | 44.2 | 47.8 | 42.5 |
| 43.7 | 153 | 151 | 156 | 153 | 43.7 | 46.0 | 40.5 |
| 41.0 | 152 | 149 | 154 | 152 | 41.0 | 44.4 | 39.1 |
| 39.5 | 150 | 148 | 152 | 150 | 39.5 | 42.0 | 37.3 |

Considering, first, the height for weight comparison, it can be seen that the Girl Scouts at a given weight were shorter than the Benedict and Talbot series in all but one group, but, on the other hand, were in the majority of instances taller than the girls in the Wood series. In other words, in this comparison they lie, roughly speaking, half way between the two standard series, and consequently must be adjudged normal. Although a series of girls who are shorter for a given weight than another standard series would obviously be heavier for a given height, it is of interest to note the exact mathematical relationships when weights for heights are compared, as has been done in the second half of Table V. On the weight for height basis our Girl Scouts at a given height are heavier in every instance than the Benedict-Talbot private school girls, but lighter in five cases out of nine than the Wood standard.

It is quite clear that on the basis of the weight-height comparisons shown in this table our girls may be considered as coming well within normal limits, measuring on the whole somewhat above the Wood standard, when comparing heights for weights, and somewhat less than the Benedict-Talbot private school girls, who, we have reason to believe, are somewhat exceptional in their superior development. As was pointed out in an earlier treatment,[16] however, while the Benedict-Talbot private school girls are heavier and taller for a given age, they are not as well developed for a given height, and consequently may be considered as being slightly thin for a given height.

*General Conclusions with Regard to Normality.* From Table IV it can be seen that our girls, both as regards height and weight for age, measure up very satisfactorily with one of the best known standards, namely, the Wood standard. In a number of instances they are, however, somewhat inferior to the selected group measured by Benedict and Talbot in private schools. No group, therefore, may be asserted to be abnormal either with regard to weight or to height. Of special significance in our study is the fact that one group, namely, that aged 14 years, 1 month, is characterized by having a much smaller weight and height when compared to the private school girls than any of the other age groups, and consequently we must assert that this group, on the age basis, should be looked upon as somewhat inferior anthropometrically. At this point it should be emphasized, however, that since all our girls were selected on the basis that they were presumably in good health, this fact is not *a priori* evidence that we are dealing with a group of young girls pronouncedly abnormal physically.

It hardly seems justifiable to enter into a further discussion of the physical relationships existing in these groups, especially that between height and weight and the computed body surface area. (The data for the average body surface area of our groups of girls may be found in Table X.) We believe the evidence is sufficient to show that our groups of girls are in all cases of a type fairly representative of normal young girls, that among the various groups the group aged 14 years, 1 month, exhibits greater defections from the superstandard, such as the private schools, than any of the others, and hence, on the private school basis, and considering age-weight and age-height relationships may be looked upon as being somewhat inferior physically to our other age groups. Upon direct comparison of height for weight, however, a comparison that we believe is physiologically sounder than that of weight for age or height for age, it can be seen that all of our groups lie, for the most part, midway between the two standard series, and the seeming anthropometric inferiority previously noted with the group aged 14 years, 1 month (44.2 kgs.) disappears on this more logical basis.

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[1] Gray and Gray, Boston Medical and Surgical Journal, 1917, Vol. clxxvii, p. 894.

[2] The data here given for the Benedict-Talbot standard have not hitherto been published. They were obtained from the extension of the curve shown in figure 8, Carnegie Inst. Wash. Pub. No. 302, 1921, p. 46.

### PULSE RATE.

An examination of the earlier literature shows little of positive value with regard to the normal pulse rate of young girls lying quietly at rest. Most of the studies of the pulse rate of children have been made either in the hospital ward or in the physician's office, and in these instances the pulse rate might easily have been influenced by the factor of previous illness or by psychical disturbances. The difficulties of securing accurate records of pulse rate with young children have been pointed out in an earlier publication.[17] Bearing in mind all of the objections and difficulties there raised, we attempted to measure the pulse rate of these groups of girls. Since the measurements could be made in the morning, about 7 o'clock, upon twelve normal girls who had been lying quietly for several hours before, who had become accustomed to the environment, and were not unduly excited or agitated, we felt that pulse records obtained under these conditions would more nearly approximate the physiological normal. The difference in pulse rate when the child is awake and asleep is also a factor to be considered, but in practically all of our observations the girls were awake. In the evening prior to retiring the girls were cautioned to lie quietly in the morning until the pulse was counted. While this requirement was not strictly adhered to in every instance, in the large majority of cases it was fulfilled most satisfactorily.

Before discussing the group results, the influence of repeated experiences in the respiration chamber upon the basal pulse rate is worth recording. Seven of the girls were present in two or more tests, and for these girls we have given in Table VI the pulse rates noted in each of these tests. Since the pulse rate was counted by two different observers, a period of approximately five or six minutes intervening between the first and the second count, the table shows both these counts. In five of the seven cases the lowest pulse rate was *not* found on the first day, thus speaking for a slightly greater psychical disturbance on the first day. Since most of our subjects participated in only one test, this would mean that in all probability our values for pulse rates, as recorded on the first day, are a little higher than they would have been, had the girls been more accustomed to the entire routine. The possibilities of rather rapid, inexplicable changes in pulse are shown with subject No. 44, whose pulse rate on April

TABLE VI.—PULSE RATES OF GIRLS STUDIED ON TWO OR MORE NIGHTS.

| Subject number[1] | Jan. 24 | | Feb. 14 | | March 20 | | April 10 | |
|---|---|---|---|---|---|---|---|---|
| | First count | Second count | First count | Second count | First count | Second count | First count | Second count |
| 1 | 87[2] | 90[2] | 91[3] | 92[3] | -- | -- | -- | -- |
| 35 | 88 | 82 | 80 | 78 | -- | -- | 76 | 78 |
| 36 | 84 | 81 | 74 | 74 | -- | -- | -- | -- |
| 39 | 80 | 77 | -- | -- | 70 | 74 | 73 | 78 |
| 38 | 68 | 62 | 70 | -- | -- | -- | -- | -- |
| 46 | 82 | 85 | -- | 79 | 71 | 70 | -- | -- |
| 44 | 96 | 87 | -- | -- | 76 | 76 | 98 | 94 |

[1] Subject numbers underlined represent girls who have *not* reached puberty; [2] Obtained January 3; [3] Obtained January 10.

10 was nearly 20 beats higher than on March 20. At the time of taking the pulse no particular explanation could be given for this. It seemed inadvisable to cause possible apprehension and disturbance by taking the temperature or making special comment on it, but we have no reason to suspect a febrile state.

The detailed pulse records, first and second counts, for the entire series of observations are given in Table III, along with the data for the ages, weights, and heights for the several age groups. Average values for the first and second counts are likewise recorded. A general inspection of these data shows that the differences in pulse rate between the two counts are very pronounced in many instances, while in many others almost no differences are to be observed. It was impossible for us to attempt to correlate with these different readings any crude observations as to psychical state (degree of suppressed excitement, the influence of the novelty of the situation and of the observation of pulse countings upon other girls, etc.), but every effort was made to minimize these factors by previous, repeated instructions the evening before, when the girls were cautioned to lie quietly in the morning with no muscular movements. In spite of these instructions, it is obvious that some degree of interest obtained. Under these conditiions one would normally expect to find that the second count was on the whole a little lower than the first, since the novelty of the first count would have helped somewhat in adding to the experience. An inspection of all the records shows that in 36 cases the pulse rate was lowest in the first count and in 60 cases lowest in the second count, while in nine cases no difference was observed between the two counts.

Of greatest importance, however, is the average pulse rate for the group. Whatever individual differences may occur, the average pulse rate should be not far from that to be expected with a group of young girls lying quietly in the morning. These average minimum pulse rates, together with the ranges in minimum pulse rate, have been summarized in Table VII. The average values were obtained from the pulse data in Table III, the lowest records, whether found in the first or second count, being averaged for the several girls in each group. Considering, first, the range in minimum pulse rate, it is clear that there are differences between the girls in the several groups approximating on the average nearly 30 beats. The absolute maximum difference is 39 beats, noted on March 13, and the minimum difference is 17 beats, noted on March 6. These ranges speak for the striking differences noticeable in young children. The average minimum pulse rate for the several groups is, however, of most interest to us. A nexamination of Table VII shows that the highest record was 83 beats per minute with the 15-year-old group, and the lowest record was 71 beats with the 16-year-old group. No special range or average value seems to be at all correlated with the age, although it would appear as if the high value for 15 years was somewhat unusual.

Table VII.—Average Minimum Pulse Rates of Girls[1] 12 to 17 Years of Age.
(Records obtained between 6.30 A.M. and 7.00 A.M.)

| Date | Average age[2] | Minimum pulse rate | |
|---|---|---|---|
| | | Range | Average |
| 1920 | yrs. | | |
| Jan. 3 | 17 | 58 to 89 | 74 |
| Jan. 10 | 16 | 59 to 91 | 71 |
| Jan. 17 | 15 | 60 to 96 | 83 |
| Jan. 24 | 14 | 62 to 99 | 80 |
| March 20 | 14 | 67 to 88 | 76 |
| April 10 | 14 | 66 to 94 | 76 |
| Feb. 14 | 13 | 56 to 94 | 79 |
| March 13 | 13 | 53 to 92 | 74 |
| March 6 | 12 | 73 to 90 | 81 |

[1] The pulse rates of eleven girls were studied on January 17, March 20, and April 10; 12 girls on all other dates.

[2] All girls in the 15, 16 and 17 year old groups had reached puberty; none of the girls studied on April 10 and March 13 had reached puberty; five girls on January 24, two on March 20, four on February 14, and 11 on March 6 had *not* reached puberty.

It will be noted that there are three dates when 14-year-old groups appear and two dates when 13-year-old groups appear. These were days on which tests were made with the special object of securing evidence with regard to the influence of the prepubertal and the pubertal state upon metabolism. While, with the fluctuations in pulse rate noted with individuals, a careful analysis of the influence of puberty is hardly possible with so few groups as this, it is of interest to compare the pulse data for the three groups of 14-year-old girls. Thus, with the group studied January 24 comprising seven girls who had begun to menstruate and five who had not, the pulse rate was actually a little higher than it was with the other two groups, namely, the group of March 20, comprising nine girls who had begun to menstruate and two who had not, and that of April 10, representing 11 girls, none of whom had reached puberty. With the two groups of March 20 and April 10 the pulse rates are identical, and since none of the girls of April 10 had attained puberty, while the majority of the girls of March 20 had attained puberty, no influence of menstruation or development to the point where menstruation had begun can be said to hold with regard to the pulse rate. The value of 80 beats on January 24 is, to be sure, a little higher than the two values of 76 beats on March 20 and April 10, respectively, but obviously no specific influence of the pubertal state can be ascribed to this average. Of the two 13-year-old groups that of March 13 was composed only of immature girls, while that of February 14 included four girls who had not reached puberty. The average pulse is somewhat higher for the February 14 group, 79 as against 74. In consideration of the findings with the 14-year-old groups it seems quite impossible to ascribe the higher pulse rate on February 14 to the fact that eight of the 12 girls in the group had reached puberty. Little, if any, positive information can be drawn with regard to the influence of puberty upon the pulse rate from an examination of the values for the range.

To sum up, then, our data show the following average minimum pulse rates for resting girls. 74 beats at 17 years, 71 beats at 16 years, 83 beats at 15 years, 77 beats at 14 years, 77 beats at 13 years, and 81 beats at 12 years. The last value of 81 beats at 12 years may be compared with the average value of 75 beats for the three 12-year-old girls studied by Benedict and Talbot. (See Table II.)

The records in the earlier literature on the pulse rate of children are subject to all the difficulties attending pulse measurements that we have mentioned. Many writers do not even differentiate between girls and boys. Consequently a direct comparison of the earlier data with these new records obtained on our girls while quietly resting is questionable. Katzenberger,[18] in 1913, collected practically all of the earlier literature on the pulse rate of children, and likewise included a large number of observations of his own. His own average values for girls at the ages in which we are particularly interested are as follows: 87 beats at 12 years, 82 beats at 13 years, and 86 beats at 14 years. These values are all considerably higher than ours, *i.e.*, 81, 77, and 77 beats, respectively.

*(To be continued.)*

## Book Review.

*A Physician's Anthology of English and American Poetry.* Selected and arranged by Casey A. Wood, M.D., and Fielding H. Garrison, M.D. Oxford Universty Press. 1920.

Of the many tributes offered to Sir William Osler on his seventieth birthday, none could have procured him more intimate delight than this little volume, presented to him in manuscript form. The duty and the love that men bore him could hardly have been gathered into a garland of friendship, fresher, more choice than this. These radiant and triumphant songs in the English tongue form, in this new context, a "recordatio" or vivid remembering of him who, in the flesh, died at Oxford but in spirit remains, an ageless witness of the integrities that bind man to man, "the great humanist of modern medicine, the friend, inspirer, and encourager of youth, in whom the poet did not die young." Dr. Garrison's felicitous "Foreword" on Osler and the uses of the poetic spirit cannot fail to strike the liberal and gentle mind as consonant and supremely fitting. Throughout the compilation, a rare ear for music, for numerosity, and a fine gift of selection, is shown. Following a well-considered sequence from "Youth" through "Senectute" to "Divina Mors" man's hopes, needs, beliefs, loves are here in brief, expressed with all the majesty, high manner and charm of which he, as poet, is capable in his brightest and best moods. What more could be set within the narrow limits of a bibelot of this size? It was a happy thought on the part of the editors to issue the work through the Oxford University Press, for Dr. Osler had been, for some years before his death, one of the overseers of that press and was deeply interested in its past history and present operation.

The present collection is devoted neither to poetry by medical men nor to poems on medical subjects, as is stated in the Foreword. Selections range from Shakespeare and Ben Johnson to Yeats, Brooke and Sassoon.

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We regret that in the issue of the Journal for February 24, in a review of "Massage and Exercises Combined" the names "Brooks and Porter" were mentioned as the publishers instead of the author, Albrecht Jensen, Box 73, G. B. I., New York City.

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## THE TYPHUS SITUATION.

In view of the extraordinary publicity given the typhus situation at the port of New York and the erroneous impression created by some of the representations, the following statement of the facts has been made by Surgeon-General Cumming of the U. S. Public Health Service.

The menace to this country from the introduction of typhus from Europe is not of recent development and is no greater today than it was six months ago. Even before the armistice the Surgeon-General recognized the potentialities of the disease spreading to the United States if adequate precautionary measures were not taken when immigration was resumed. During the past year, medical officers of the Public Health Service have been stationed at American Consulates at chief European ports of embarkation to supervise measures to be applied against ships and passengers for the prevention of the spread not only of typhus but also of plague and cholera. While the measures enforced at the European ports have by no means been perfect, their value is indicated in the fact that several hundred thousands of immigrants have come from typhus-infected areas on several hundred ships and that out of all this number typhus infection occurred only on eight vessels. With the exception of the *Presidente Wilson*, which arrived at New York on February 1, infection on the ships was detected by the quarantine officer at New York and effective precautionary measures applied. Upon arrival of the *Presidente Wilson* at New York, there were three cases in the sick bay of what the quarantine officer diagnosed as bronchopneumonia but which later proved to be typhus. The doctor was experienced in the detection of typhus, but the cases presented no eruption and the mistake was by no means inexcusable. Still under the custodial care of the immigration authorities, the sick people were sent to the Long Island College Hospital which takes care of sick immigrants, and the correct diagnosis later became apparent. Fortunately the error was discovered before the other passengers in the steerage were released, and the vessel and the immigrants were remanded to quarantine and appropriate treatment applied to prevent the spread of infection. The incident was unquestionably deplorable, but it indicated neither a breakdown of the New York quarantine station nor any unreasonable laxity.

The system of quarantine protection developed by the Public Health Service consists of a double line of defense, first, the medical officers of foreign ports who supervise preventive measures specified in the United States Quarantine Regulations, and second, the facilties at United States quarantine stations. If infection evades the first barrier, the ship still has to undergo inspection and treatment at her American port of arrival.

Several weeks before the arrival of the *Presidente Wilson*, the Surgeon-General had taken very definite steps to strengthen the quarantine defense at European ports by having the American consular officials instructed, through the State Department, to withhold bills of health from vessels whose passengers had not been satisfactorily disinfected. As early as January 17, quarantine officers at Atlantic ports were advised that on account of the unsatisfactory delousing procedure carried out at Danzig, all passengers arriving at their ports should be held in quarantine and treated for the destruction of vermin. It must, therefore, be evident to any fair-minded person that the federal health authorities have been most diligent in carrying out anti-typhus measures, and that any statement that either the Federal Health Service or the State officials of New York have been derelict or indifferent to the typhus situation is obviously untrue. Nevertheless, administrative efforts of this sort cannot be expected to be perfect or to eliminate mistakes by individual officials.

Typhus is not transmitted by lice in general, but only by lice that have previously bitten persons infected with typhus. A louse is by no means an exotic insect, as one might infer by some of the interviews in New York papers. It is widespread throughout the United States, but is found chiefly in the slum districts of large cities. In the absence of typhus it is of no sanitary significance or danger so far as the present situation is concerned. Typhus fever develops in four to twelve days, and it is readily apparent to any trained sanitarian that if cases do not develop within this period it can safely be asserted that the infection is not present. This applies particularly to overseas vessels that have been out twelve days or more.

Much confusion has resulted from the statements in newspaper interviews in New York City as to responsibility of the Immigration Service at Ellis Island for the exclusion of typhus fever. Immigration officials are not vested with any authority for administering quarantine laws. Furthermore, they have no equipment for enforcing quarantine measures—naturally so because they have control over aliens and not over citizens of the United States, although the latter returning from Europe are just as serious a menace from the typhus standpoint as is an alien. It is true that Ellis Island has always proved a valuable line of second defense for the port, but the responsibility for the exclusion of typhus and other quarantinable diseases rests solely upon the quarantine authorities. As a matter of ordinary decency and personal hygiene, delousing facilities should be provided at Ellis Island, but since the prevention of the introduction of typhus relates to returning citizens as well as to aliens, the quarantine station is the one place where effective preventive measures can be carried out.

As to the statement that "one infected immigrant might spread a plague that would cause a million deaths in six weeks in New York," it is interesting to note that, while not generally known, typhus fever has existed in New York City for years. About 1910 Dr. Nathan Brill recorded a series of somewhat less than 200 cases which he had observed in the previous ten years, and during 1911, 34 such cases occurred in New York City, and others have occurred from time to time since that date. For the most part they were of isolated occurrence and indicated that conditions in New York City were not conducive to any serious spread of the infection. Goldberger and Anderson of the U. S. Public Health Service, in 1911, demonstrated by laboratory tests that the so-called "Brill's disease" was identical with Old World typhus; that the clinical manifestations were very similar but much milder in type, that the disease was transmitted by the louse in the same way as the Old World typhus, and while not so virulent, sometimes resulted fatally.

## MEDICAL NOTES.

U. S. Public Health Service Hospitals in Pennsylvania.—Plans prepared by the U. S. Public Health Service, and about to be put into effect, will largely increase the hospital facilities for ex-service men in Pennsylvania, particularly at Pittsburg and Philadelphia.

At Pittsburgh the capacity of the Marine Hospital (No. 15) will be trebled at first by the addition of a dozen portable buildings of approved type, and later, when Congress appropriates the necessary money, by new and permanent brick and tile construction. At present funds are available for the erection of portable temporary buildings only. The importance of Pittsburg and the growing demand on the Government hospital facilities there make these additions imperative.

At Philadelphia the U. S. Public Health Service has recently acquired from the Navy a large hospital for the care of ex-service men suffering from nervous and mental diseases. Its capacity is between 400 and 500. Recent heavy demands for accommodation by this type of patients have conclusively shown the need for this hospital, which it is hoped may become permanently devoted to its present use.

**U. S. Public Health Service and the Rutland Sanatorium.** — The model tuberculosis sanatorium nearing completion at Rutland, Massachusetts, originally established by the New England Sanatorium Association, has been leased for a term of years by the U. S. Public Health Service. Within two months it is expected that the sanatorium will be able to accommodate one hundred patients and it will ultimately care for 300. The plans under which the sanatorium is now being enlarged have been approved by the U. S. Public Health Service and by the architect of the National Tuberculosis Association on duty with the Public Health Service. The finished building will be the latest work in modern tuberculosis construction, the surroundings are ideal, and the tuberculosis service men who will shortly fill this hospital will be assured of the best that modern science can provide.

**Improvements in Government Sanatoria.**—The eminent tuberculosis specialists who at the request of Surgeon-General Cumming of the U. S. Public Health Service, have been visiting the tuberculous hospitals of the Service "to see that every one of the 20,000 tuberculous ex-service patients shall have the best treatment to be had in any hospital in the land," have completed their task and have submitted their suggestions.

Steps to put into effect their suggestions vere immediately taken, and are already in peration in part. The new developments will ntail some additional expense and additional mployment of personnel. The specialists, Dr. David Lyman of Wallingford, Conn.; Vicor Cullen of the Maryland State Sanitarium, Martin E. Sloan of Towson, Md., George Thomas Palmer, Springfield, Ohio, and Henry Hoagland of La Jolla, California, represent the ighest ideals in the tuberculosis sanatorium management and their suggestions, when caried into effect, will provide the very best type anatoria.

**Libraries in Public Health Service Hospials.**—The fact that the sundry civil appropriion bill, reported to the House of Representaves, appropriates $100,000 for the purchase of library books, magazines and papers for beneciaries of war risk insurance will be welcome ews to military patients in Public Health Service Hospitals. The American Library Association, which still administers the libraries in the larger hospitals, is embarrassed financially and has to be assisted by other organizations. The new appropriation saves the situation; but, unless it is made available immediately instead of not until July 1, as is customary, reading matter will necessarily be at a premium in all hospitals caring for soldier patients.

**Mental Patients in Public Health Hospitals.**—The congestion in the neuropsychiatric hospitals of the U. S. Public Health Service throughout the country has been brought out by the necessity of transferring 30 military patients from the big Service Hospital on Gray's Ferry Road, Philadelphia, to make room for other patients who had greater claims on its facilities. By the time the transfer could be carried out the hospital was again crowded to capacity. The Service is now caring for 5,910 neuropsychiatric patients, and the number is steadily increasing. Search is being continually made by official and non-official organizations for buildings that might be leased by the Service for hospitals. Such, however, have proved to be few and far between, and the necessity of building those needed is daily becoming more and more apparent. It is the policy of the Public Health Service to provide for all neuropsychiatric patients. in its own hospitals instead of in contract hospitals; but until proper buildings can be had this is impossible.

### BOSTON AND MASSACHUSETTS.

**Week's Death Rate in Boston.**—During the week ending March 5, 1921, the number of deaths reported was 217 against 294 last year, with a rate of 14.97 against 18.97 last year. There were 30 deaths under one year of age against 34 last year.

The number of cases of principal reportable diseases were: Diphtheria, 60; whooping cough, 23; scarlet fever, 61; typhoid fever, 5; measles, 77; tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 3; scarlet fever, 4; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 2; whooping cough, 3; scarlet fever, 1; measles, 2; tuberculosis, 21.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 4.

Encephalitis lethargica: cases, 9; death, 1.

# Correspondence.

## ANTI-VACCINATION PROPAGANDA IN THE PRESS.

*Mr. Editor:—*

In the current (26 February, 1921) number of *The Cambridge Tribune*, costing ten cents for eight pages, is an editorial entitled "Are We a Free People?" which suggests that in some respects we are even too free, for it tends to subvert the laws of the Commonwealth in regard to the required vaccination of school children.

Did this same near-viewing editor advise his readers (even if not more numerous than those of any other New England journal) that it is right to spit on the subway platforms, or to drink alcohol denatured with "methylated spirits," or to cough and sneeze in the faces of people in a crowd, or that mussels and clams from the South Cove are excellent food, even if eaten raw, or that heroin may be properly taken for backache, he probably would be squelched sooner or later. Yet he is allowed to print deluding statements, like the following, unmolested.

> "But there is in this Commonwealth a large and constantly growing number of law-abiding citizens who have good reason for being opposed to vaccination if it is to be practiced on themselves. They are not guided by a whim and they are people of at least the average intelligence. Their position comes about through their positive conviction, gained, in many instances, through hard experience.
>
> "Now very naturally they object to being vaccinated or having their children vaccinated against their wills. And in this they are supported by a very respectable number of the medical profession. In this connection it looks very much as though the pro-vaccinationists lacked a sense of humor, when they insist on the efficacy of their treatment as a preventive measure, and yet admit that this preventive efficacy vanishes into nothingness (we almost said native nothingness) when they are exposed to on unvaccinated person.
>
> "But the main point is this: Are we a free people? If so, then we will no longer assent to be autocratically governed by any system which compels one to accept any particular medical system as an essential to admission to the public schools. We trust that the Legislature will give this feature of the case due consideration."

This man either knows nothing of the history of smallpox on this earth, and nothing of the vaccination statistics, or else he puts his narrow prejudice against the common health. How eloquent a well-informed orator could be on this matter!

How unfortunate for the education campaign that is trying so variously and so strenuously to show the public how to be healthy and how to live long! It has to "buck" not only ignorance but prejudice—the blindness that simply will not see, or seeing, refuses to admit the vision.

An old, trite story certainly is this, but one that is liable to be of practical importance to multitudes at any time, even here in Boston.

George V. N. Dearborn.

Boston City Hospital.

## PHYSICIANS AND THE TELEPHONE.

*Mr. Editor:—*

With the recent edict of the N. E. T. & T. Co., to compel physicians to pay for their telephone service at business rates instead of residential, it is well to have the question threshed out: Are we physicians really business men or professional men? Until now, the N. E. T. & T. Co., with the rest of the world, considered us a professional class, whose profession, the practice of medicine, was on a par with the profession of the clergy, of the literary man, of the teachers and educators, who are still enjoying the privileges of lower residential rates. Why this sudden change, this additional burden on our already quite overburdened shoulders? Is the medical profession going to submit to this arbitrary ruling meekly without a protest? Of course the individual physician has no other choice but to submit to it and thank the Lord that, in its wisdom and charity, the N. E. T. & T Co. is not demanding from us the payment of the difference in rates for all these past years during which, undoubtedly under false pretenses, we have enjoyed the privileges of professional men. A telephone nowadays has become a primary necessity, especially in the physician's home, and no doubt we should have to submit to such a demand.

But what an individual cannot do, an organization must. It seems to me that it is the duty of the Massachusetts Medical Society, the organized body of physicians in this state, to protect its members against such unjust extortion on the part of a most powerful monopolistic corporation. A hearing before the proper authorities should be at once demanded and our viewpoint presented and defended.

To submit to such an arbitrary rule without a protest before the proper authorities would be cowardice and a lack of self-respect on our part.

Dr. M. J. Konikow.

Roxbury, Feb. 25, 1921.

## NOTICES.

Massachusetts General Hospital.—The fifth monthly meeting of the out-patient staff will be held in the Lower Out-Patient Amphitheatre at 12 Noon, Wednesday, March 23.

"The Correlations between X-ray Findings and Clinical Signs in Diseases of the Chest." by Dr. George W. Holmes and Dr. John B. Hawes, 2nd.

*Staff Clinical Meeting*—Lower Out-Patient Amphitheatre, Monday, March 28, 1921, 8 p.m.

"Some Results of the Operative Treatment of Cancer of the Stomach Breast, Rectum and Uterus at the Massachusetts General Hospital." By Dr. C. L. Scudder, Dr. R. B. Greenough, Dr. D. F. Jones and Dr. Lincoln Davis.

Dr. F. G. Balch will preside.

*Staff Clinical Meeting*—Lower Out-Patient Amphitheatre, Monday, April 11, 1921, 8 p.m.

"Results of Neurological Surgery at the Massachucetts General Hospital." By Dr. W. J. Mixter and Dr. George Clymer.

Doctors, nurses and medical students cordially invited.

F. A. Washburn, M.D., *Resident Physician.*

New England Association for Physical Therapeutics—The next regular meeting of the New England Association for Physical Therapeutics will be held on Tuesday, March 22, 1921, at 8 o'clock, at the Hotel Victoria, 271 Dartmouth Street, corner Newbury Street, close by Copley Square Station, Boston.

The subject of the evening will be a talk by Dr. Byron S. Price, 17 East 38th Street, New York City. His talk will probably be on the use of x-rays on glandualr tissue, as Dr. Price has done considerable on the removal of tonsils by x-ray.

Tables will be reserved for table d'hote dinner in the grill room, Hotel Victoria, at 6.30 p.m.

L. B. Hayden, *Secretary.*

## MARRIAGE.

Announcement has been made of the marriage of Dr. George Woodworth Lougee to Miss Florence G. Morse on February 21, 1921.

# The Boston Medical and Surgical Journal

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## Original Articles.

### WHEN TO OPEN KNEE-JOINTS.

By H. W. Marshall, M.D., Boston.

A surgeon might reply that knees should be opened whenever an operation will be of benefit. A very conservative non-operating physician might say that all other methods should be tried first.

Such differences of opinion are unavoidable because surgeons know favorable possibilities of operations most accurately and the limitations of other methods; while physicians who never operate know merits of non-surgical methods and disadvantages of operations especially. Both should be commended for their accurate special knowledge. If the ideas of both are collected, shuffled together, and all fitted carefully then on anatomical and physiological foundations without trying to show advantages of any special clinical method strikingly, there will result modified points of view of interest. The writer will try to deal briefly with a few common knee affections with this aim in view.

#### SYNOVITIS.

A tall, lean, muscular Dane fifty-one years old, cement finisher by trade, was at work on his hands and knees when suddenly he felt a sharp pain in one knee. He was in average health at the time as far as he was aware, and he did not traumatize his knee except in rather rough usage of repeated kneeling. Pain persisted and the knee became swollen. He entered an excellent hospital and submitted to an arthrotomy six days after the onset of his trouble. The operation was done skillfully and consisted in making a large incision above the patella which permitted thorough examination of the joint and quadriceps pouch. More than five months after the operation when the writer first examined him there was normal motion practically in flexion and extension of the leg and no abnormal lateral mobility existed at the knee. The operation wound had healed perfectly with no stretching or adherence of the scar. There was no abnormal joint crepitus nor abnormal joint effusion. The capsule of the joint was not thickened, and on the whole the knee had a very normal appearance.

Is this result a decided success that shortened the course of joint inflammation, or should it be interpreted as undesirable treatment which disabled the patient a longer time than if he had not been operated on? His attitude now happens to be a dissatisfied one because his knee is still too sensitive to kneel on continuously, and because it gives out on descending stairs, so that he is unable to accept other work.

Statistics from series of clinical cases will not answer such a question as the foregoing one conclusively. There are some exceptionally brilliant results both in operated and non-operated groups, and differences between them are not convincing. Operations do not abort all cases quickly at least, and conservative physicians point out that many patients who refuse operations subsequently recover completely in approximately same lengths of times, as many of those who undergo surgical treatment. Yet, perhaps, such patients might have recovered even more quickly than they did if they had submitted to arthrotomies.

Anatomical and physiological considerations have to be turned to when indeterminate situations are encountered in clinical evidence. It is certain that arthrotomies accompanied by irrigations of joint cavities remove synovial accumulations that sometimes possess toxic properties. It is true also that irrigation fluids exert some physiological influence on synovial linings. Incisions into joints when the latter are distended with excess of synovial fluid relieve intracapsular pressures and tend to prevent capsular stretchings. These points will be discussed in turn.

Synovial accumulations may have two important actions. Increase of fluid separates synovial surfaces and protects them when in an irritated state by reducing mechanical frictions in subsequent joint movements. This is an extremely beneficial influence that is liable to be lost sight of among prominent pathological symptoms and signs. Accumulated synovial fluid contains toxic substances, without doubt, when it has a purulent character, and under these circumstances it exerts a mixed influence. In instances in which micro-organisms are not demonstrable in synovial fluids and which comprise a large percentage of cases, theoretically there may or may not be present toxic substances which have leaked through synovial capillaries out of toxic circulating blood. It is not known in the majority of clinical cases actually whether beneficial or harmful influences predominate in synovial accumulations.

If formations of synovial fluids are recalled, it will be remembered that serous fluids pass through capillary walls into connective tissue spaces. Connective tissues become oedematous and there may be proliferations of connective tissue elements if irritations are greatly prolonged.

Linings of joint cavities apparently exert selective actions on serous fluids because synovial contents are more than simple transudates. It would not be surprising if some protective action of synovial linings against passage of blood toxins into joints is found at some future time. Possibly toxins are partly restrained in connective tissue spaces out of reach of irrigating fluids, but nothing definite is known of existing conditions.

It is known that synovia resist a considerable amount of sepsis inside joint cavities successfully at times, so that joints may be closed tightly after washing them out, although some staphylococci have been present in the serous fluid.

Experiences with penetrating wounds of knee-joints in war injuries have shown surgeons repeatedly that many such knees can be left several weeks quietly, with profit, until joint resistances have increased.

Then joints can be opened, cleaned out, and closed, generally with best results; because synovial linings possess peculiarities analogous to those of peritoneal surfaces. Both are able to take care of variable amounts of internal septic irritation depending on the normal reactions of healthy tissues of healthy individuals.

Septic joints of pyaemic origin often are restored to normal function again to surprising degrees when joint drainage is avoided. Drainage is being found to be indicated less and less frequently.

When discharging joint sinuses exist, the utility of early, gentle massage, even during subsiding stages of acute inflammations, is becoming more widely recognized as such treatment is conducted skillfully in a manner to accelerate lymphatic circulation about inflamed regions.

Various details of surgical care of septic joints must be left, however, to papers that present convincing case reports.

Synovial fluid varies within wide limits. It may be clear and straw colored, or turbid with cell débris. It may contain fibrin in scanty quantities or in severe very chronic inflammations there may be loose jelly-like moulds of fibrin filling the joints. At times it has characteristics of an inflammatory exudate even consisting of frank pus. Synovial fluid normally contains salts, proteids, a mucin-like substance and water, and it has a variable specific gravity.

Irrigating fluids possess differing physiological influences, depending on their chemical and physical properties, and practically there should be included with physiological influences of irrigations also mechanical frictions sustained in moving joints to and fro while attempting to introduce fluids into all parts of joint cavities. At times irrigations simply mean introductions of small streams that trickle out again promptly as small streams, without coming into contact generally with synovial surfaces. If irrigation fluids are of proper chemical natures and of right concentrations, of proper temperatures, and if they reach all parts without harmful mechanical irritations of joint surfaces, then the latter will be favorably stimulated, probably, by single applications to slight degrees. When synovial tissues already are struggling unsuccessfully with increasing blood-carried toxins. their resistances may become very low, and conceivably they may be embarrassed rather than slightly relieved by added influences of joint irrigations at these particular times, especially it the latter are not precisely correct in nature. Clinical evidence does not disprove that a large percentage of irrigations are useless or slightly harmful in their direct influences on synovial linings at onsets of inflammatory processes. In subsiding stages of acute synovitis, however, there is more data to base judgments on in estimating the advantages of arthrotomy. Tissue resistances then are increasing and some irrigations that might have been too strong for earlier stages are more liable to be favorable in their actions on more stable tissues. Explorations of joint cavities in subsiding or late stationary stages of severe synovitis furthermore permit removals of fibrinous clots that might lead to adhesions of serious nature, also they allow inspection of synovia at times when tubercular infections or villous hypertrophies are suspected.

Single irrigations in subsiding stages of synovitis with immediate subsequent closures of joints cannot produce very great influences. And irrigations of joints toxically irritated through the blood are in a different class from the repeated irrigations of septic joints when the latter have been caused by local infections from penetrating wounds.

Continued extreme capsular stretching by synovial accumulations should be prevented undoubtedly, in order to avoid subsequent laxities of ligaments as well as to prevent bacterial infiltrations of weakened joint capsules and subsequent chronic inflammatory thickenings. Operations have distinct advantages over purely non-operative measures in this respect, but large accumulations can be kept down by aspirations and tight elastic pressures.

Defects of surgical technique occasionally occur and lead to impaired results of treatment, but these are too well understood to demand discussion. Surgeons realize that best results depend on most evenly balanced judgments exercised in all details of operative procedures. Poor results may be traced at different times to origins in any one of the minor steps of an operation, such as too extensive or too small incisions, handling of tissues, infections, suture material, drainage, control of hemorrhage, closure of incisions, post-operative care.

In the illustrative case that has been cited, the patient was dissatisfied because his knee was not dressed until seven days had elapsed after his operation. Then a large quantity of fluid squirted, so he states, from the operation wound when one end was purposely opened to liberate the subcutaneous accumulation of serum. He erroneously interpreted a good surgical practice as gross neglect.

Subcutaneous serous exudates may be derived, it should be recalled in passing, from reactions of tissues to surgical handling; also, possibly, to subsequent leakage from the joint cavity, and from rapid drainage of oedematous periarticular tissues.

It may be claimed by some surgeons that formations of sterile subcutaneous serous accumulations accelerate anatomical recoveries and tend to avoid capsular thickenings. Others may argue that there would be more rapid restorations of synovial functions with quicker subsidence of joint tenderness, as exhibited in the patient whose case has been cited, if synovial surfaces had been left more perfectly protected by a slight accumulation of fluid within the joint, and perhaps both views are correct.

### CONCLUSIONS REGARDING ARTHROTOMIES FOR SYNOVITIS.

1. Arthrotomies are generally harmless when done by skillful surgeons. Patients are placed conveniently for efficient control of other steps in treatment when they are in hospitals, and excellent recoveries are the rule in instances of non-purulent synovitis.

2. Early arthrotomies are unnecessary, as well as harmless in non-purulent cases, and great

advantages which are unattainable otherwise do not result from them. Important advantages are not shown convincingly in series of clinical cases, nor do arthrotomies possess marked theoretical superiorities in early cases.

3. Arthrotomies performed during later stages of slowly subsiding chronic knee inflammations of considerable severity possess distinct advantages. They permit examinations of synovial linings for evidences of beginnings of tuberculosis, developing villous enlargements, and other internal knee derangements. They allow removal of fibrinous clots that might lead to serious adhesions, and possibly exert minor accelerating effects towards recoveries of synovial functions from single applications of irrigating fluids.

4. Excessive conservatism in opening knee-joints should be avoided because of the harmlessness of surgery when operations are skillfully done, and because of their positive benefits in selected instances.

5. Conclusions with regard to the illustrative case that has been cited are that it is impossible to decide positively from clinical data alone whether surgery has prolonged or shortened this patient's disability.

The writer's interpretation of the case is that perfect surgery prevented capsular stretching, the joint capsule and periarticular tissue outdistancing the synovial lining in return to a normal state again. At the present time, when capsular and periarticular thickening has disappeared almost to the point of slight atrophy from disuse there is practically perfect motion, but the temporarily slightly impaired function of the synovium which is shown in persisting tenderness and joint weakness, perhaps, would not be of such marked degree now if the synovium had been more perfectly protected continuously by a moderate excess of joint fluid.

If no operation had been performed probably the various reparative processes would have kept pace more evenly with each other. There might be a little more stiffness and soreness of periarticular origin with less noticeable synovial tenderness and joint weakness. With more restricted motion and less noticeable weakness, he might be at work which did not require kneeling. But differences in results of operative and non-operative treatment in cases like this one probably are not large or of very great practical importance.

Before protective synovial fluids are washed out in early cases. there should be knowledge that they are more toxic than beneficial in nature, but to ascertain such points convenient, new biochemical reactions of joint fluids are needed that are still undiscovered.

Recent advances in knowledge of joint physiology, moreover, tend to emphasize the importance of maintaining local lymph circulation. Perhaps post-operative conditions with complete rest are inferior to slight voluntary shiftings in positions of joint structures from time to time when synovia are protected naturally by joint effusions.

### VILLOUS ARTHRITIS.

Villous arthritis is characterized by chronic thickenings of synovia, including synovial villi and fringes that occur normally in knee-joints. Clinically these conditions give evidence of their existence in unusual crepitus when joints are moved as the hypertrophied tissues interfere with each other or get pinched between bearing surfaces.

Causes producing initial thickenings of joint linings include traumata, toxemias and bacterial infections, or combinations of these different factors. From almost imperceptible beginnings, synovial thickenings may increase under continued influence of normal joint use, and through continued mechanical frictions accompanying activity irritate or pull out folds in the lining if the latter get caught between bearing surfaces until, in some instances, pedunculated or free joint bodies are produced.

Well-developed villous arthritis may terminate in a variety of ways.

1. Subsidence and complete restoration of joint functions are most common results after variable numbers of months depending on severity of villous hypertrophies and efficiency of treatments.

2. Continued interference with joint functions for a year or longer from hypertrophied synovia may result, because of repeated new injuries, or continuance of toxemias or infections, or neglect of treatment, or from combinations of these causes.

3. Under these circumstances joint effusions increase and subside alternately, depending on fluctuating amounts of irritation. Capsules weaken and stretch or thicken if they become chronically inflamed by infiltrations of microorganisms. Such states are compatible with very considerable activity for years, neverthe-

less, and a few patients manage to endure chronically weakened enlarged knee-joints without ceasing their usual occupations and without proper medical care.

4. Tubercular disease may develop in thickened synovial linings. Presumably such infections can occur at any period in the course of knee inflammations, or they may be initial causes of synovitis in some instances. All that can be stated positively is that some hypertrophied synovial tissues are found to be tubercular on surgical exploration, and some are not tubercular.

5. Pedunculated villi or detached loose bodies may be formed gradually that eventually slip into comparatively non-obstructing positions from which they emerge at irregular intervals to produce intermittent acute symptoms, or not infrequently they become adherent in non-obstructing positions and more permanent relief than is obtained.

6. Operations are performed with benefit in many instances and at all stages of villous hypertrophy. The topic of surgical treatment overlaps to considerable extent the one concerning operations for synovitis previously mentioned.

### OPERATIONS FOR VILLOUS ARTHRITIS.

Conveniences and activities of patients are involved rather than matters of life and death, and accordingly there are widely differing reasons in different cases for or against operative interference. Patients' occupations and positions in life, as well as severity and chronicity of symptoms, hold important place in determining what shall be done. Each problem should become an individual one in which the patients' wishes as well as the strictly medical viewpoints are taken into consideration in arriving at decisions as to most appropriate methods of treatment.

When operations are performed the following clinical results are possible:

1. Removals of pedunculated villi or loose bodies which have been causing marked symptoms are followed by marked relief immediately when wounds have healed and walking has been resumed.

2. Too much synovial tissue is removed at times apparently, especially in less severe types and from supracondylar pads of fat. Patients then complain of sensations of weakness persisting for long periods subsequently, and they have some difficulties in stepping up to or down from different levels.

3. Extremely gradual changes for better or worse take place after operations many times that should not be interpreted generally as results of surgical interference. The changes would have taken place, presumably, whether or not surgical treatment had been received in the majority of instances. Usually such very slow post-operative changes take place in middle-aged persons whose joints also show definite osteo-arthritic bony changes that have been developing for years.

Simple arthrotomies with careful removals of small bits of synovial tissues probably represent minor incidents in the progress of joints toward steady deterioration under continued faulty vascular conditions in these middleaged patients. At times operations under these circumstances appear to produce a little improvement for awhile, and on the other hand the unavoidable trauma that attends surgical interference is sufficient to accelerate downward tendencies not infrequently. In all such instances the position of main importance is held by osteo-arthritic disease rather than villous accompaniments.

4. Practical experience proves that arthrotomy with excision of thickened synovial tissue from vigorous young adults at least does not do very much harm when operative technique is executed skilfully, and perfect recoveries of joint functions very often are met with after conservative surgical treatments.

Surgical management provides excellent control of patients, and enables some to recover more quickly because they could not be persuaded otherwise to remain quiet for sufficiently long periods to permit their chronically inflamed knees to recover.

Many arthrotomies that are done for villous arthritis probably are unnecessary as well as harmless especially in the earlier stages.

### OTHER KNEE INFECTIONS.

Loosened or detached semilunar cartilages, torn crucial ligaments, fractures of patellae, tibiae and femora, tuberculosis, and neoplasms, all necessitate opening of knees at times; but only a few points relating to some of these topics can be mentioned in this brief paper.

Loose semilunar cartilages may act like pedunculated villi and interfere with joint motions. When there are recurring attacks of acute symptoms removals of cartilage fragments are followed promptly by decided relief. Occasionally partly loosened cartilages fall back into normal positions apparently and become reattached without operations if new injuries are avoided, similarly as pedunculated villi slip into non-obstructing places and occasionally become adherent.

There is little harm in waiting during early stages in many instances of cartilage dislocation in spite of occasional abrupt interference with normal motions. When there is a serious inconvenience experienced, then cartilages should be operated on but unnecessary surgery can be avoided safely by conservative methods. As with cases of villous arthritis, each patient should be treated according to individual medical and non-medical peculiarities of the situation.

Complete ruptures of crucial ligaments are serious complications of knee-joint injuries that cannot be discussed, nor can precise indications be given for opening knees after fractures. There may be marked synovial irritations following fractures which make surgical interference advisable because of chronic thickenings, while in other instances slightly crushed tibial heads or femoral condyles repair and readjust themselves best without operations.

Tuberculosis of knee joints of adults should be treated by joint excisions as soon as synovial tissue has been proved definitely to be tubercular by microscopic examination. When tubercular knees of adults are made stiff, the general health usually improves and they are able to resume active lives. When excisions are not made, then tubercular knees continue to cause intermittent or constant trouble, knee functions gradually diminishing, and in a few neglected instances final spontaneous ankylosis following long disability accomplishes by natural means what is quickly done by surgical excisions.

Non-tubercular joint adhesions in septic cases produce complete ankylosis, or more or less limitations in ranges of joint movements, and with or without accompanying pain. There have been devised operations to restore motion in completely ankylosed joints by means of animal membranes and fascia after adhesions have been loosened. On the other hand, painful knees with greatly restricted motions sometimes are made fixed and painless by operations as tubercular knees are treated, or there may be attempts at increasing the range of motions by distending joint capsules with olive oil or other fluids. Obviously each case must be treated individually on its particular merits with reference to anatomic range of motion and physiological degrees of pain and weakness represented.

### WHEN NOT TO OPEN KNEE-JOINTS.

No attempts at knee-joint surgery should be made unless proper facilities for strict surgical asepsis are at hand because serious impairments of joint functions do occur occasionally as results of operations, and many questionable minor advantages gained through early opening of many clean joints are overbalanced if serious harm is done in a few other instances.

Post-operative infections develop occasionally when surgical asepsis has been perfect. This is possibly by blood infections. If weakened joint tissues have their resistance lowered still further by long and clumsily executed operations with much handling of tissues and with attempts at local sterilizations by means of very strong local applications, then circulating micro-organisms sometimes gain foothold if surgical abuse exceeds certain limits although surgical asepsis has been maintained scrupulously.

A young man seen recently by the writer had been troubled to a moderate degree with a joint-mouse that could be felt at times very plainly beneath the joint capsule. He had submitted to an operation which was done under strict surgical precautions under local anesthesia. The joint body was found to have deep inaccessible attachments that could not be cut for some reason, and after protracted trial the knee was closed with the joint-mouse still *in situ*. After several months of incapacity from a swollen painful knee, there was good return of function, but he refuses further treatment of surgical nature now.

Many middle-aged patients with chronic hypertrophic arthritis should not be submitted to arthrotomies except for unusual reasons, because pathological processes are liable to be accelerated rather than retarded by operations frequently. Degenerative changes taking place in Charcot knees also seem to be accelerated frequently by surgical interference. Hemophilic joints should not be opened, and there are a host of borderline cases of various sorts about which there will be controversies always as to most appropriate methods of treatment. All that can be said is that each case should receive careful consideration from point of view of patients' probable future activities as well as from probable harmlessness of surgical measures, therefore moderate conservatism in operating should be advocated for the majority of cases.

It is the writer's belief that most radical and enthusiastic surgeons should be supported in their skillful attempts to extend the scope of surgery when they operate on venturesome patients who are willing to take necessary risks and consequences. Surgery has to depend on them both for its wider extension and its most rapid progress.

On the other hand, doubtful or unnecessary operations should not be performed in fairness on patients who expect conservative treatment without unnecessary hazards.

Extreme conservatism seems as desirable in some instances as extreme surgical enthusiasm, and between these limits somewhere the majority of cases should be grouped for greatest satisfaction to patients and for continued welfare of the medical profession.

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# THE ENERGY REQUIREMENTS OF GIRLS FROM 12 TO 17 YEARS OF AGE.

By Francis G. Benedict and Mary F. Hendry, Boston.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

*(Continued from page 286.)*

## INSENSIBLE PERSPIRATION.

By insensible perspiration is meant that loss in weight of the body not attributable to the loss of solid or liquid excreta. It consists for the most part of water vaporized from the lungs and skin, but contains also a relatively small amount of organic carbon and hydrogen oxidized from the body material. Consisting as it does so largely of water vapor, it is subject naturally to such fluctuations as affect the water vapor output. In all probability the main factor affecting insensible perspiration is muscular activity, either minor or major. If this is the case, the insensible perspiration may be looked upon as a more or less crude index of the total metabolism.

In spite of the relative simplicity of the technique for determining the insensible perspiration, we have been able to find in the literature no data for young girls other than those of Camerer.[19] Among his values dealing with the ages interesting us are those for two girls. One girl, at the age of 12½ years, with a body weight of 32.6 kgs., showed an average loss per kilogram per hour for 24 measurements of 0.74 gram, while at the age of 15 years, with a body weight of 43.3 kgs., she showed an hourly loss of 0.51 gram per kilogram. With another girl at the ages of 13, 14½, and 17 years, with body weights of 30.3, 35.7, and 39.6 kgs., the average hourly loss per kilogram was 0.73, 0.62, and 0.55 gram, respectively.

It was possible for us to measure the insensible perspiration of our girls on six different nights, and our data for these nights are given in Table VIII. The time represented by the measurements was approximately from 10.30 p.m. to 7.15 a.m. As in the pulse table (Table III), those girls who had not reached maturity, *i.e.*, who had not begun to menstruate, are indicated by numbers underlined. An examination of the data in Table VIII for those girls who were present on more than one night is of interest, first, as showing the influence of apprehension caused by the novelty of the observations, resulting in inability to go to sleep immediately or in restless sleep. The data for these girls indicate that there was a slightly higher insensible loss during the first night than during the second or third nights, and consequently one can conclude that our figures are on the whole perhaps a little higher than they normally would be if the girls had been subjected to repeated observations. The several groups of girls appear in Table VIII in the order of decreasing age, while within the groups themselves the data are given according to decreasing body weight. This arrangement of the values enables us to note if there is any influence of age or weight upon the insensible loss. A careful inspection of the table shows that no apparent correlation exists between either age or weight and insensible perspiration per kilogram of body weight.

Laying particular stress upon the loss per kilogram per hour, we see that only in a few instances are values over one gram noted, and it is probably true that these values are affected by some extraneous factor, such as excessive muscular activity. If we make the wholly arbitrary and fairly questionable assumption that these values of one gram and over are abnormal and average the values below one gram, we find that the averages for the several groups are as given in Table IX. Here we

TABLE VIII.—INSENSIBLE PERSPIRATION OF GIRLS 13 TO 15 YEARS OF AGE.

| Date, average age, and subject number[1] | Body weight (without clothing) | Insensible perspiration | |
|---|---|---|---|
| | | Per hour[2] | Per kilo. per hour |
| 1920 | kgs. | gms. | gms. |
| Jan. 16-17<br>14 yrs. 10 mos. | | | |
| 31 | 61.5 | 42 | 0.68 |
| 28 | 57.3 | 29 | .51 |
| 29 | 64.5 | 61 | .94 |
| 34 | 52.8 | 40 | .76 |
| 26 | 50.5 | 38 | .75 |
| 32 | 47.9 | 30 | .63 |
| 25 | 45.8 | 40 | .87 |
| 30 | 45.6 | 40 | .88 |
| 27 | 45.1 | 35 | .78 |
| 33 | 44.0 | 39 | .89 |
| 24 | 43.5 | 33 | .76 |
| Avg. | 49.9 | 38 | .77 |
| April 9-10<br>14 yrs. 1 mo. | | | |
| 39 | 62.2 | 40 | .64 |
| 35 | 57.2 | 28 | .49 |
| 91 | 46.7 | 28 | .60 |
| 90 | 45.3 | 25 | .55 |
| 44 | 45.1 | 45 | 1.00 |
| 89 | 41.4 | 35 | .85 |
| 93 | 40.8 | 30 | .74 |
| 94 | 40.8 | 27 | .66 |
| 88 | 37.0 | 27 | .73 |
| 95 | 35.8 | 29 | .81 |
| 92 | 33.8 | 26 | .77 |
| Avg. | 44.2 | 31 | .71 |
| March 19-20<br>14 yrs. | | | |
| 86 | 71.5 | 41 | .57 |
| 39 | 59.9 | 30 | .50 |
| 80 | 56.6 | 46 | .81 |
| 46 | 55.7 | 29 | .52 |
| 81 | 55.7 | 32 | .57 |
| 83 | 52.5 | 28 | .53 |
| 79 | 50.6 | 32 | .63 |
| 87 | 48.6 | 31 | .64 |
| 82 | 44.8 | 34 | .76 |
| 44 | 44.5 | 30 | .67 |
| 84 | 41.0 | 30 | .73 |
| 85 | 38.8 | 22 | .57 |
| Avg. | 51.7 | 32 | .63 |
| Jan. 23-24<br>13 yrs. 8 mos. | | | |
| 39 | 59.2 | 48 | 0.81 |
| 35 | 58.7 | 40 | .68 |
| 45 | 56.7 | 47 | .83 |
| 38 | 55.3 | 47 | .85 |
| 40 | 52.7 | 42 | .80 |
| 37 | 50.7 | 43 | .85 |
| 41 | 49.2 | 40 | .81 |
| 44 | 44.2 | 54 | 1.22 |
| 42 | 42.2 | 56 | 1.33 |
| 43 | 41.7 | 39 | .94 |
| 36 | 33.3 | 37 | 1.11 |
| Avg. | 49.4 | 45 | .93 |
| Feb. 13-14<br>13 yrs. 4 mos. | | | |
| 35 | 58.2 | 31 | .53 |
| 38 | 56.2 | 47 | .84 |
| 46 | 54.2 | 26 | .48 |
| 50 | 42.7 | 24 | .56 |
| 47 | 41.7 | 29 | .70 |
| 49 | 41.7 | 21 | .50 |
| 52 | 41.7 | 29 | .70 |
| 53 | 40.7 | 30 | .74 |
| 48 | 40.2 | 46 | 1.14 |
| 51 | 36.7 | 34 | .93 |
| 54 | 36.2 | 64 | 1.77 |
| 36 | 33.7 | 27 | .80 |
| Avg. | 43.7 | 34 | .81 |
| March 12-13<br>12 yrs. 10 mos. | | | |
| 68 | 47.4 | 42 | .89 |
| 78 | 47.4 | 28 | .59 |
| 74 | 46.0 | 35 | .76 |
| 75 | 41.6 | 30 | .72 |
| 73 | 39.9 | 38 | .95 |
| 72 | 38.9 | 39 | 1.03 |
| 67 | 36.3 | 36 | .99 |
| 71 | 35.8 | 25 | .70 |
| 70 | 34.6 | 18 | .52 |
| 77 | 34.5 | 25 | .72 |
| Avg. | 40.2 | 32 | .79 |

[1] Subject numbers underlined represent girls who have *not* reached puberty..

[2] The total period of measurement was 8¾ hours for the observations of January 16-17, January 23-24, and February 13-14; 9 hours for March 19-20; and 9¼ hours for March 12-13 and April 9-10.

see that the lowest value is found with the 14-year-old group of March 19-20 (body weight 51.7 kgs.), *i.e.*, 0.63 gram per kilogram per hour or 32 grams per hour. This figure may be taken as representing most probably the true insensible loss of a group of girls of an average age of 14 years. The extreme range in the insensible loss per kilogram per hour is from 0.63 to 0.82 gram, a range that is perhaps not surprising. Although every effort was made to secure constant temperature and relative humidity, these conditions could not be perfectly met, as shown by our records of the average temperature of the dry and wet bulbs, as well as of the relative humidity, on the six different nights. It may be mere coincidence that the highest insensible loss per kilogram, 0.82 gram, occurred on the night with the highest temperature of the dry and wet bulbs and with the highest relative humidity, 44 per cent. The absolute minimum excretion of 0.63 gram, however, does not occur with either the highest or the lowest temperature. Theoretically one would expect that the higher the relative humidity, the less would be the vaporization of water from the lungs and skin, since the air is more nearly saturated in the beginning. It is more than likely, however, that we have to deal here not so much with the desiccating effect of dry air as with the slight influence upon comfort of the changes in humidity, and if any relationships were to be established between the temperatures and the water vaporized, *i.e.*, insensible perspiration, these would have to be looked upon almost exclusively as a secondary rather than a primary effect of the temperature and humidity. We cannot hold that our evidence speaks for a definite effect of humidity upon insensible loss.

### THE GASEOUS METABOLISM OF GROUPS OF YOUNG GIRLS.

Quite aside from the physiological interest of the pulse rate and the insensible perspiration, our observations were primarily designed to secure evidence with regard to the total heat production of young girls while in complete muscular repose, and, as nearly as practicable, in the post-absorptive condition. It has been definitely demonstrated that with adults the basal metabolism is affected by several factors, weight, sex, age and height. By careful biometric analysis[8] each of these factors has been shown to have an independent influence, that of weight being the most pronounced. In studying the metabolism of children from birth to puberty[2] it was found that the age element *per se* played a very important rôle in the metabolism, much more so than with adults. Since the data for children were not sufficiently extensive to submit to special biometric analysis, it was not possible to show that height had an independent effect, although a sex differentiation was clearly shown. With our groups of girls, ranging in age fro m12 to 17 years, it was reasonably supposed that the age factor would not by any means have disappeared or reached the low level that it does with adults. The differentiation of the influence of the several factors, particularly age, height and weight, with young children is complicated by the fact that with children all three of these factors are simultaneously developed. As the girl grows older she increases in weight and in height. With adults no such definite relationship is established, although there are, of course, periods when there is a distinct tendency for adults to take on weight, as between 40 to 50 years, and to lose weight, as in more advanced age. It seems best, consequently, to study these girls primarily from the point of view of age, attempting to correct for the weight and other growth factors by comparisons on the basis of the metabolism per unit of weight or per unit of surface area. With children, as has been stated before, abnormal relationships between weight and height are not usually found. In other words, children run more true to type, while with adults there are many instances of obesity and not infrequently of undernutrition.

TABLE IX.—INSENSIBLE PERSPIRATION PER KILOGRAM PER HOUR OF GIRLS 13 TO 15 YEARS OF AGE.

(AVERAGE VALUES)

| Date | Average age | | Insensible perspiration per kilo. per hour | Temperature | | Relative humidity |
|---|---|---|---|---|---|---|
| | | | | Dry bulb | Wet bulb | |
| 1920 | yrs. | mos | gm. | °C. | °C. | p. ct. |
| Jan. 16–17 | 14 | 10 | 0.77 | 19.2 | 11.7 | 35 |
| April 9–10 | 14 | 1 | .68 | 18.2 | 11.2 | 37 |
| March 19–20 | 14 | 0 | .63 | 19.1 | 12.0 | 38 |
| Jan. 24–24 | 13 | 8 | .82 | 21.6 | 14.9 | 44 |
| Feb. 13–14 | 13 | 4 | .68 | 19.7 | 13.2 | 43 |
| March 12–13 | 12 | 10 | .76 | 20.2 | 13.6 | 43 |

From measurements of the gaseous exchange, information with regard to three distinct physiological points may be derived. In the first place, from an analysis of the oxygen deficit and the carbon-dioxide increment in the air in the respiration chamber measurements can be made of the respiratory quotient, which will indicate the character of the katabolism or the nature of the material burned, and, what is of greater practical importance for this research, which will give a clue as to the calorific value of carbon dioxide best suited for applying to the total carbon-dioxide measurements to compute the heat production. Secondly, the total carbon-dioxide production measured throughout the night is of value in indicating directly the total heat production of young girls under conditions of "bed rest." In the third place, the measurement of the minimum carbon-dioxide production during the night gives information with regard to the probable basal metabolism.

### RESPIRATORY QUOTIENT.

We shall consider first the ratio between the carbon dioxide produced and the oxygen consumed, *i.e.*, the respiratory quotient. From the results obtained on two hundred or more men and women studied in the Nutrition Laboratory it has been found that the average respiratory quotient in the post-absorptive condition is 0.82. These determinations were, however, made under conditions that were strictly post-absorptive, that is, the subjects were all approximately 12 hours without food. It could not be assumed that the respiratory quotients of the groups of young girls studied in our respiration apparatus would necessarily be this value, since with the girls the measurements were made at an interval by no means as great after the last meal as in the case of the adults. The evening meal was always taken at 6 o'clock. The carbon-dioxide measurements rarely began before 11 P.M., and usually at 12 P.M.,—approximately 5½ hours after the completion of the last meal rather than the canonical 12 hours. On the other hand, both the quality and the quantity of the meal were adjusted so as to minimize the storage of glycogen. The protein content was moderately low, *i.e.*, on the average 20 grams, so that its stimulating effect was reduced. The meal may on the whole be looked upon as a rather light meal (approximately 500 calories), particularly for active girls, for it not infrequently happened that these girls came to the Laboratory after an afternoon spent in more or less severe Girl Scout drill and marching.

The respiratory quotients were determined for four groups of girls with astonishingly uniform results. Thus, values were found of 0.81 on January 2-3, of 0.81 and 0.80 on January 16-17, of 0.78 and 0.78 on January 23-24, and of 0.79 on February 13-14. Of special significance is the fact that these quotients are all lower than the average quotient of 0.82 found with adults in the post-absorptive condition. This may be in part accounted for by the relatively light supper. Moreover it is not unreasonable to suppose that these low quotients may be explained by another factor, namely, the more rapid metabolism of early youth, which has contributed to the depletion of glycogen storage or at any event has retarded the massing of any great proportion of glycogen in the body. We believe that the evidence here accumulated is sufficiently indicative to justify further investigation. A study of the effect of abundant carbohydrate feeding upon the glycogen storage of youth, similar to that made at the Nutrition Laboratory by Higgins[20] and others, on adults, should prove of great physiological importance.

Little information can be derived from the earlier respiratory quotients obtained by Benedict and Talbot, owing to the fact that these were in so many instances determined but a few hours after food. We were, frankly, considerably surprised at the low quotients found with our girls seven to eight hours after their supper. But the accuracy of the Sondén apparatus for determining both carbon dioxide and oxygen can hardly be questioned. This particular apparatus has been in use for several years and all analyses were made by one of us after several years' experience. We must take it, therefore, as highly probable that the respiratory quotient of groups of young girls eight hours after a light meal is somewhat lower than that found on the average with adults.

The consistency with which we found these seemingly low respiratory quotients made it seem undesirable for us to make the determinations in all of our tests. The deviations between the various quotients are so small as to justify, in our judgment, the use of an average value, *i.e.*, 0.79. From the practical standpoint this average quotient made it possible for us to select the most accurate calorific value of carbon dioxide to be employed in the computation of the energy transformations. Accordingly, we have used 3.086 calories as the calorific value of a gram of carbon dioxide, and the heat production has been computed by multiplying the carbon-dioxide production by this factor.

### TOTAL ENERGY OUTPUT DURING BED REST.

Among the factors affecting the carbon-dioxide production are, first, the influence of the preceding meal (an influence which with these girls, as pointed out in the preceding section, must have been somewhat greater, although probably not very much greater, than that obtaining during the post-absorptive state), and second, the after-effect of muscular activity. In practically all instances the girls were undergoing a novel experience. There was considerable jollification and activity just prior to going to bed and the usual exuberance of youth found outward expression in pillow fights and in dancing and jumping about for a relatively few minutes. Unquestionably this activity stimulated the metabolism somewhat, but we believe that the preliminary period, which lasted frequently an hour or more, sufficed practically to rule out this disturbing factor. One of the requirements of the experiments was that the girls should remain quiet after going to bed and not talk or engage in any activity. This was well adhered to in general. We did not begin actual measurements until we were reasonably certain that every girl was quiet, if not actually asleep. Consequently we may fairly consider that our measurements represent the carbon-dioxide production of girls during "bed rest" and, for the most part, asleep. Since "bed rest" is a condition which plays a very important part in the 24-hour routine of every normal child, the average child spending not far from 10 out of the 24 hours in bed, while in sickness the entire 24 hours of a patient's day may be spent in bed, these carbon-dioxide values and especially the energy values computed from them have more than ordinary significance. The average heat production for this entire period of bed rest does not represent the basal, minimum metabolism, but it does represent an energy expenditure that must ultimately be supplied from food. Before considering the true basal metabolism, therefore, it seems advisable to make a study of the data secured in our measurements of the total carbon-dioxide production, and particularly the heat values computed from it.

The actual length of period during which the carbon dioxide produced was collected and absorbed varied somewhat on the different nights, but usually extended from approximately 11.30 P.M. until 6.30 A.M. To simplify matters and make the values more comparable, we have reported only the average carbon dioxide produced by the squad as a whole, per hour. In Table X we have included, in addition to the dates, average ages, weights, heights, and surfaces, the average carbon dioxide produced by each squad as a whole, per hour, and the heat production per 10 hours, first, per individual, then per kilogram of body weight, and finally, per square meter of body surface. Since we are assuming that the average child has 10 hours of bed rest, we have reported these values all on the 10-hour basis. Obviously by a shift of the decimal point the per hour figures can be instantly noted.

Our main problem in studying the heat production of girls was to note the influence of age, and consequently we have recorded our data in Table X on the basis of decreasing average age. Bearing in mind that we are dealing here with average values, in every instance for at least 11 and usually for 12 girls, we see that the average carbon-dioxide produced per squad per hour ranged from 189.3 to 226.9 grams, although but 11 girls appear in the group with

TABLE X.—HEAT PRODUCTION OF GIRLS 12 TO 17 YEARS OF AGE.

| Date[1] (a) | Average age (b) | | Average body weight (without clothing) (c) | Average height (d) | Average body surface (Du Bois height-weight chart) (e) | Average carbon dioxide produced by squad per hour (f) | Heat (computed[2]) per 10 hours during "bed rest" | | | Minimum carbon dioxide produced by squad per hour (j) | Basal heat (computed[2]) per 24 hours | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Per individual (g) | Per kilo. (h) | Per sq. m. (i) | | Per individual (k) | Per kilo. (l) | Per sq. m. (m) |
| 1920 | yrs. | mos. | kgs. | cms. | sq. m. | gms. | cals. | cals. | cals. | gms. | cals. | cals. | cals. |
| Jan. 2- 3 | 17 | 0 | 58.1 | 163 | 1.62 | 225.9 | 581 | 10.00 | 359 | 203.9 | 1258 | 21.7 | 777 |
| Jan. 9-10 | 15 | 10 | 53.6 | 163 | 1.57 | 213.4 | 549 | 10.24 | 350 | 189.5 | 1170 | 21.8 | 745 |
| Jan. 16-17 | 14 | 10 | 49.9 | 160 | 1.51 | 189.3 | 531 | 10.64 | 362 | 186.3 | 1254 | 25.1 | 830 |
| April 9-10 | 14 | 1 | 44.2 | 155 | 1.39 | 195.6 | 549 | 12.42 | 395 | 188.0 | 1266 | 28.6 | 911 |
| March 19-20 | 14 | 0 | 51.7 | 161 | 1.52 | 225.1 | 579 | 11.20 | 381 | 215.6 | 1331 | 25.7 | 876 |
| Jan. 23-24 | 13 | 8 | 50.0 | 159 | 1.49 | 226.9 | 584 | 11.68 | 392 | 223.9 | 1382 | 27.6 | 928 |
| Feb. 13-14 | 13 | 4 | 43.7 | 153 | 1.37 | 207.8 | 535 | 12.24 | 391 | 192.4 | 1188 | 27.2 | 867 |
| March 12-13 | 12 | 10 | 41.0 | 152 | 1.33 | 208.7 | 537 | 13.10 | 404 | 198.7 | 1226 | 29.9 | 922 |
| March 5- 6 | 12 | 2 | 39.5 | 150 | 1.29 | 199.4 | 513 | 12.99 | 398 | 191.2 | 1180 | 29.9 | 915 |

[1] Eleven girls were studied on January 16-17 and April 9-10; 12 girls on all other dates. All girls in the 15-, 16-, and 17-year old groups had reached puberty; none of the girls studied on April 9-10 and March 12-13 had reached puberty; 5 girls on January 23-24, 2 on March 19-20, 4 on February 13-14, and 11 on March 5-6 had *not* reached puberty.

[2] Using a respiratory quotient of 0.79 and 3.086 calories as the calorific equivalent of a gram of carbon dioxide.

the lowest carbon-dioxide production. Since the number in the groups was not always the same, direct comparison between the different groups on the basis of the average carbon dioxide produced per hour is not permissible.

Turning our attention to the average heat production per 10 hours *per individual,* we note that the values range between 513 and 584 calories, with an average of 551 calories. When a finer differentiation is made, however, with the attempt to equalize on the basis of body weight, we note that the range is from 10.00 to 13.10 calories per kilogram per 10 hours, and here we find a distinct tendency for the higher values to appear with the younger and, it should be pointed out, also lighter-weight girls. Computed per square meter of body surface area (Du Bois height-weight chart), the heat production per 10 hours ranges from 350 to 404 calories, the higher values also appearing with the younger girls.

Since a more accurate and satisfactory comparison of the several groups upon the age basis can best be made in the selected periods of quiet, minimum metabolism, further discussion of the 10-hour heat values will not be entered into here. Of prime importance in connection with this series of observations is the fact that the average young girl between 12 and 17 years of age has an energy production during 10 hours of bed rest amounting to approximately 550 calories. To have the caloric needs for 10 out of the 24 hours in the life of young girls of this age range thus definitely established is of very considerable physiological importance.

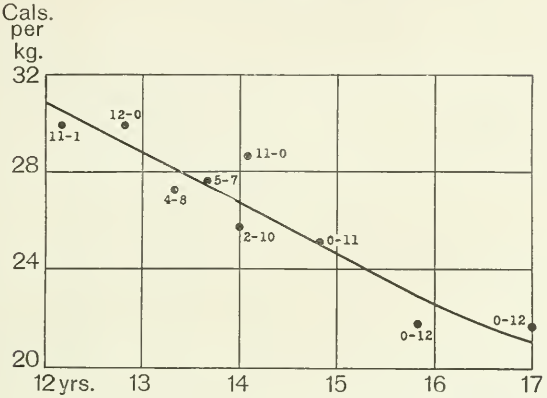
### TOTAL BASAL HEAT PRODUCTION.

In this discussion we are primarily interested in the total heat production, as it is this factor which must be taken into consideration in computing the average energy needs of young girls. As a result of our measurements we have data for computing the average basal heat production of nine groups of young girls, ranging in average age from 12 to 17 years, in average weight from 39.5 to 58.1 kgs., and in average height from 150 to 163 cms. The minimum heat production per individual computed on the 24-hour basis (shown in column *k* of Table X ranges from 1170 to 1382 calories, averaging 1251 calories. At first sight, when one considers the differences in age, in height, and particularly in weight, the approximation to uniformity in this average figure of 1251 calories is astonishing, to say the least, and the deviations therefrom in the different groups are surprisingly small. Thus, the lowest value is but 81 calories below the average and the highest but 131 calories above, and it would almost appear as if the heat production of these different groups of girls was utterly independent of the age, weight or height. For general purposes of computation, therefore, where large groups are involved, the use of a round figure of 1250 calories to represent the 24-hour basal heat production of the average girl between 12 and 17 years of age would be thoroughly justified. Since with adults, as stated above, four factors at least influence basal metabolism, namely, sex, age, height, and weight, further consideration should be given to these energy values for girls, in which the attempt should be made to rule out variations due to weight.

### BASAL HEAT PRODUCTION PER KILOGRAM OF BODY WEIGHT REFERRED TO AGE AND WEIGHT.

The simplest method of securing a uniform basis for the comparison of the heat production of individuals of various sizes is that long-established one of computing the metabolism per kilogram of body weight. Of course this method does involve the rather broad assumption that each kilogram of body mass has the same heat-producing power. With obese subjects this is a particularly erroneous assumption. Still, with our groups of girls, who are not characterized by extreme emaciation on the one hand, or obesity, on the other, the comparison may be legitimately made. Accordingly we have computed the values for the basal heat production per kilogram per 24 hours, and have recorded them in column *l* of Table X, also in the order of decreasing age. When we consider the total heat production per individual per 24 hours, we find a rather close agreement throughout the entire series, but considering the heat computed per kilogram of body weight we note a tendency for the values to deviate considerably. The lowest value is 21.7 calories per kilogram and the highest is 29.9 calories. With reference to age it can be seen that here we are dealing with the distinct evidence of a higher heat production per unit of body weight the younger the girl, the age element here being a very pronounced factor There is a reasonably uniform tendency for the

Figure 2.—Basal Heat Production of Girls per Kilogram per 24 Hours Referred to Age.



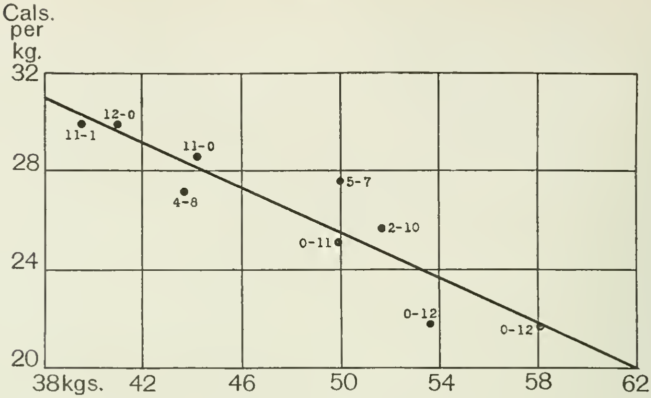
The first of the two figures accompanying each point on this and the following charts represents the number of girls in the group who had *not* as yet menstruated; the second figure indicates the number who had.

values to decrease regularly with increasing age, the most marked exception perhaps being noted with the group on April 9-10, aged 14 years, 1 month.

This relationship between the age of the several groups and the heat production per kilogram of body weight is perhaps best shown by a chart. Accordingly in Figure 2 we have plotted the calories per kilogram referred to age, and have drawn through these points the line representing, in the judgment of five individuals, the most probable trend of the metabolism. An inspection of Figure 2 shows that there is a reasonably uniform tendency for the heat per kilogram to decrease with increasing age. The most noticeable deviation from the slightly curved line, arbitrarily laid on this chart, is that of the group aged 14 years, 1 month, noted above, which exhibits a metabolism higher than that indicated by the curve. Of special importance, therefore, in the comparison of the age with the metabolism under conditions of computation where the differences in body weight are presumably ruled out or at least minimized, is the fact that a specific, high metabolism for the lower ages is very evident. The fact that the general trend can best be expressed by a line so nearly straight does not speak for any pronounced irregularities in the metabolic trend of girls between the ages of 12 and 17 years.

While at first sight it would appear as if the computation of the heat production per kilogram of body weight removed practically all influence of body weight itself in the comparisons, it has been seen with younger children, at least, that the heat production per unit of body weight varies greatly, although it is very difficult with children, where age and weight changes are so pronounced, to differentiate sharply between the influence of age *per se* and weight *per se* upon heat measurements on any computed basis, even that of the heat per kilogram of body weight. Still, in examining the data in column *l* of Table X, we find that a distinctly high value appears for the age group of 14 years, 1 month, namely, 28.6 calories per kilogram. The question may be asked, "Is this high value due to the influence of age or is it due to the fact that we are dealing here with a group of physically smaller girls, both in weight and in height?" It will be necessary, therefore, to consider the heat production per kilogram of body weight with changing weights rather than ages, and this comparison has been made in Figure 3. Nearly all the points lie very close to the straight line indicating the general trend. The rather wide deviation from the line noted in Figure 2 for the group aged 14 years, 1 month, *i.e.*, 44.2 kgs., here disappears, the 50.0 and the 53.6 kilogram groups now showing the widest deviation, which in this comparison is proportionately somewhat greater than that shown by the 44.2 kilogram group on the age basis. In column *l* of Table X it can be seen that the value

Fig. 3.—Basal Heat Production of Girls per Kilogram per 24 Hours Referred to Weight.



of 28.6 calories lies between 25.1 and 25.7 calories, but if this table were re-arranged on the basis of decreasing body weights instead of decreasing ages, the value of 28.6 calories would appear among the lower weights, and hence properly grouped with the higher per kilogram figures. While the general trend of values in column *l* makes it very evident that we are dealing here with a higher heat per kilogram of body weight with the younger girls, we must recognize the fact that with rapidly growing organisms it must not be assumed that computing the heat production per kilogram of body weight rules out the influence of body weight *per se,* and the facts that we have noted in connection with the 14 years, 1 month old group, with a small body weight of 44.2 kgs., distinctly lend credence to the belief that the influence of *body weight* affects computations even on the basis of per kilogram of body weight. It is of special significance that the two groups at 16 and 17 years, with an average body weight of 55.9 kgs., should have a heat production of 21.7 calories per kilogram, while the two youngest groups, likewise having the two lowest body weights, show identical values of 29.9 calories, *i.e.*, an increase in the heat production per unit of body weight amounting to 8.2 calories or somewhat over 37 per cent.

### BASAL HEAT PRODUCTION PER UNIT OF BODY SURFACE REFERRED TO AGE AND TO WEIGHT.

As has been shown in earlier researches, changes in body surface area represent more nearly the general morphological law of body growth than do changes in body weight. Therefore it is important particularly in the period of rapid growth to compare the metabolism under all measurable conditions. Thanks to the studies of D. and E. F. Du Bois,[7] we may now speak intelligently and accurately of the body surface area of humans. Without assuming the existence of a "law" relating to the loss of heat in proportion to surface area, we may compare the heat production of our different groups of girls to their surface areas. In column *m* of Table X are given the values for the heat production computed per square meter of body surface per 24 hours. The values range from 745 calories with the group 15 years, 10 months old to 928 calories with the group 13 years, 8 months old, the average value for the entire series being 863 calories per square meter. Thus we see that the lowest value is 118 calories below the average and the highest is 65 calories above. There is, furthermore, a distinct tendency for the higher values to appear with the younger ages, although the group aged 13 years, 4 months, exhibits a relatively low metabolism. The values for the heat per square meter referred to age have been plotted in Figure 4. Here there is a very definite indication of a marked slope to the line which would represent the general trend of all observations.

Recognizing that girls of the same age or, indeed, groups of girls of the same age, may differ very considerably in body weight and that even computing the heat per square meter of body surface may not rule out factors other

Fig. 4.—Basal Heat Production of Girls per Square Meter of Body Surface per 24 Hours Referred to Age.

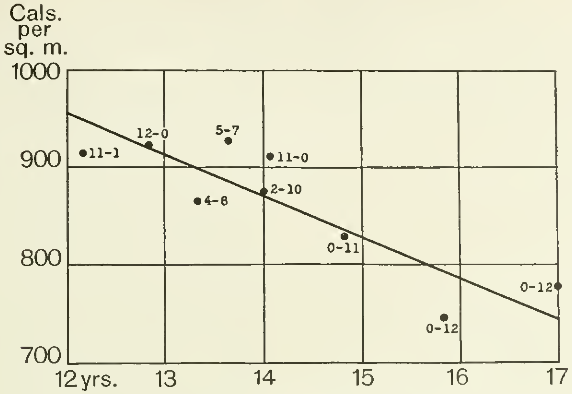
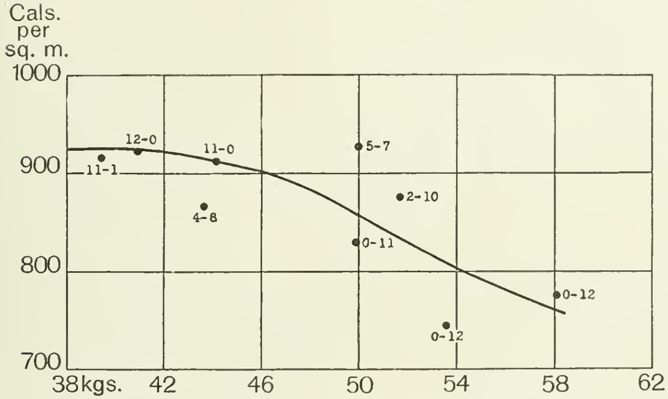


Fig. 5.—Basal Heat Production of Girls per Square Meter of Body Surface per 24 Hours Referred to Weight.



than age, we deem it of value to note the calories per square meter of body surface referred to weight. This comparison has been made in Figure 5. On the basis of weight there is a wider scatter of individual points than on the age basis; but nevertheless there is a distinct tendency here for the lighter weight children to have the higher metabolism per square meter of body surface.

Such charts as Figures 2 to 5 illustrate even more clearly the difficulty of dissociating the weight element and age element in this rapid period of growth. It is clear from the data in column *m* of Table X and from Figures 4 and 5 that the heat production per square meter of body surface with these girls may not be looked upon as a physiological "constant." In examining these several charts one must again be reminded of the fact that each point represents the average of a group of 11 or 12 girls.

The popular conception of a uniform heat production per square meter of body surface certainly finds no proof with these groups of Girl Scouts. Indeed, the deviation of the minimum and maximum either side of the mean shows that with these groups at least there is a slightly better degree of uniformity in the *total* calories per 24 hours, as shown in column *k* in Table X, than there is in the heat production per square meter of body surface, as shown in column *m*. It is clear, therefore, that the relative uniformity noted in the total heat production per 24 hours, the continually decreasing calories per kilogram of body weight accompanying increasing age and particularly increasing weight, and the decreasing calories per square meter of body surface accompanying increasing age and weight, must all be taken into consideration in formulating any method for predicting the basal metabolism of young girls. So far as any one factor is concerned, it is clear that the average value of 1250 calories per 24 hours would more nearly represent the true heat production than would the average value for per kilogram of body weight or per square meter of body surface. Without these two latter methods of analysis, however, one would fail completely to note the specific high metabolism associated with the younger ages, a physiological fact of fully as great significance as the total caloric output per 24 hours.

### THE PREDICTION OF BASAL METABOLISM.

The prediction of the basal metabolism of groups of individuals is of value in the computation of their dietetic needs, since the basal metabolism represents the 24-hour irreducible minimum. With the present-day extraordinary interest in studying basal metabolism, it is important to have some approximation to a normal or standard with which individual measurements may guardedly be compared. The Nutrition Laboratory has repeatedly emphasized the fact that there is no standard normal metabolism from which normal individuals do not vary. But a knowledge of the general, most probable trend of basal metabolism is of great physiological and, indeed, clinical significance. The present study, representing as it does the data obtained from groups of individuals, differs considerably from all earlier studies of basal metabolism, and these values, owing to the nature of their determination, may properly be used to indicate the average normal trend.

*(To be continued.)*

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## A NOTE UPON THE PRODUCTION OF AGGLUTININS IN TYPHOID FEVER.

BY ROBERT A. KILDUFFE, A.M., M.D., PITTSBURGH,

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[From the Laboratories of the Pittsburgh Hospital.]

THE value of frequent estimations of the agglutinin titre of the blood in typhoid fever is sufficiently well recognized to need no further comment, particularly in these days when the interpretation of agglutination reactions is complicated by the possible previous use of anti-typhoid vaccine or the occurrence of mixed infections with paratyphoid strains.

Attention has recently been again directed, however, to the possible prognostic value of the procedure by O'Hara[1] and the present case report is made partly as in a small way corroborative of his observations, and particularly because of the very high amount of agglutins produced.

The quantitative estimation of agglutinins in typhoid fever is by no means a new performance: indeed, it dates from the first investigations of Widal and is, or should be, the foundation upon which rests the diagnostic interpretation of the test. Nevertheless, while the exact titre which may be obtained in the laboratory immunization of animals is a matter of frequent notation, parallel observations upon the human being are not so frequently obtained and it would appear that titres of over 1:80 or 1:200 are either infrequently encountered or not noted. This apparent lack of accessible observations on this point may be due partly to the fact that, once the diagnosis is obtained, agglutination reactions are infrequently or rarely repeated, and, partly, because no relation apparently exists between the agglutination titre and the process of immunization in the patient. Nevertheless, it would seem of interest, and, in the light of O'Hara's observations, of possible prognostic value, to make regular estimations of the agglutination titre in every case of typhoid, paratyphoid and dysentery infection.

With regard to the possible technique, there is no question of the superiority of the macroscopic over the microscopic methods from the standpoint of accuracy, delicacy, and availability for general use: and, in the case of mixed infections, the macroscopic method is the only one possessing diagnostic value.

In these laboratories a formalinized suspension of typhoid, and of paratyphoid bacilli in 0.85% NaCl solution is used as the antigen in a dose of 0.5 c.c., all dilutions of serum being made by pipette graduated in 1/100 c.c. There is no objection, however, to making the dilutions in drops with a dropper after the manner of the standard Dreyer technic. Incubation is in a water bath for one hour at 50° C., followed by the ice-box at 4°-9° C. over night.

Each serum is set up against typhoid, para A, and para B strains and a known serum included to ensure the agglutinability of the suspensions used. The usual controls to guard against spontaneous agglutination, etc., are always included.

The case report follows:

John M., aged 10; serial number 9429-A; medical number 2534, was admitted to the Pittsburgh Hospital July 15, 1920. Chief complaint, headache. Family history, unimportant. Past Medical History—In 1918, had scarlet fever complicated by an otitis media, which eventually led to a double mastoid operation. Ever since the operation there has been a discharge from the ears, the dressings being done by the mother at home. Present Illness—The patient made no complaint until eleven days before admission, when there was severe headache. Following the use of a laxative, this was improved. The following day, however, he had a chill accompanied by a return of the headache and some nose-bleed. On the day of admission he had a marked fever. Physical examination on admission showed a well-developed boy, somewhat anemic in appearance, in a semistuporous condition. The teeth showed sordes and the lips a herpetiform eruption. The physical examination was otherwise negative. Admission temperature, 104; pulse, 140, shortly dropping to 110.

The subsequent course of the case was one of increasing toxemia, the mental condition ranging from stupor to delirium. On the 28th, the entire body was covered with purpuric spots, a condition which gradually increased until, on the seventh of August there was a profuse hemorrhage from the bowels. The temperature ranged from 104 on admission to 97 on the day of death.

Laboratory Findings—July 16, urinalysis: acetone, diacetic acid, and albumin present, with diminished chlorides; numerous hyalin and coarse granular casts in the sediment. Blood—Hemoglobin (Dare) 75%; RBC 4,020,000; WBC 6,200. Agglutination tests negative. July 17—Pus from the ears gave growth of staphylococci and a small bacillus of Hoffman type. July 21—Blood culture—recovered B. typhosus. July 26—Agglutination tests positive with para B. strain in 1: 80, with B. typhosus in 1:1280. August 2—WBC 7,250. Agglutination tests positive with B. typhosus in 1:640. August 4—Agglutination tests positive with B. typhosus in 1:60. August 7—Died.

The case is of interest both on account of the high agglutinin production and because the falling titre seemed of some value as indicating the subsequent clinical course. It would also, apparently, indicate the advisability of frequent and regular estimations of the agglutinins which could readily be charted like the pulse and temperature.

I am indebted to Dr. C. J. Devlin for the opportunity of utilizing the case for this report.

REFERENCE.

[1] O'Hara: Observations on the Agglutinating Titre of the Blood Serum in Typhoid Fever. Boston Medical and Surgical Journal, Vol. clxxxiii, No. 3, pp. 77-80, July 15, 1920.

## Clinical Department.

## ACUTE EMPYEMA COMPLICATED BY WHOOPING COUGH.

### Rib Resection and Valve Drainage of the Chest under Local and Paravertebral Anesthesia.

By William Reid Morrison, M.D., Boston.

An interesting case of empyema following lobar pneumonia, and at the same time suffering from pertussis in the acute stage, was seen by the writer in a little girl two years and five months of age.

Personal History—E.V.M. was referred to the author by Dr. E. S. Boland of South Boston. Family History—Mother is living and well; has had no miscarriages. Father and three brothers are alive and well. Past History—The patient was born normally, and was breast fed until fourteen months old. She had lobar pneumonia two weeks or more, previously, lasting ten days. Present Illness—Mother has noticed rapid respiration, fever, malaise, and recurrent paroxysms of coughing and vomiting. Physical Examination—The patient was fairly well developed and nourished, and conscious. She was pale, and showed great prostration, with marked dyspnoea while sitting up; she could not lie down. Her temperature was 100.5, her pulse 120; her respiration was 46. The head and neck were negative. Chest—Left side was flat on percussion throughout. Vocal and tactile fremitus were absent. There was distant bronchial breathing. Aspiration of left chest, with needle and syringe, in the seventh interspace in the posterior axillary line revealed the presence of thick white pus, odorless. Dr. F. B. Mallory subsequently reported the organisms to be type one pneumococcus. Respiratory movements on the left were diminished. Her right chest was resonant, with exaggerated breathing. Grocco's sign, paravertebral dulness was present; the chest was otherwise negative. The heart was displaced markedly to the right; action was rapid, regular. There was no enlargement, no murmur. No x-ray examination of the chest was made. Abdomen, genito-urinary, skin, bones and joints, glandular, and neuro-muscular examinations were negative.

The parents of the patient refused adequate hospital treatment, as they considered the case hopeless. A poor prognosis was given the parents, because the patient's resistance had already been lessened by lobar pneumonia. The subsequent infection of the pleural cavity increased the prostration, as she was absorbing the poisonous toxins from a chest full of pus. Her heart and mediastinum were pushed to the right by the presence of the fluid, embarrassing her functioning right lung.

An operation at home, under novocaine anesthesia, was therefore advised and accepted. Morphine sulphate, one thirty-second of a grain, was given subcutaneously, one-half hour before operation. Benzine and half-strength tincture of iodine were used for the skin preparation. In a well-heated room, the child was wrapped in warmed blankets, and placed in a half-sitting position. Novocaine solution, one-half of one per cent., was injected locally, and paravertebrally. An incision eight centimeters long, was made parallel to, and over the ninth rib, in the posterior axillary line. The soft tissues were incised down to the rib, and were retracted upwards, then two centimeters of the eighth rib were resected subperiosteally. The pleural cavity was opened, and over a quart of pus and much detritus was allowed to escape slowly. The lung expanded fully after the patient coughed, the soft tissues acting as an efficient valve. A small drainage tube of rubber, the width of the chest wall in length, and one and one-half centimeters in diameter, was sutured to the inferior wound margin with interrupted silk-worm gut mattress sutures. The superior wound edge was sutured loosely over the tubing to the inferior margin, preventing air going in and out of the chest, and allowing free drainage. A dry sterile dressing and swathe were then applied. There was no hemorrhage and practically no shock following the operation. The general condition of the patient was poor.

During convalescence, the child was placed in a sitting position on pillows, small amounts of milk, and later, egg-nogs, were given as often as possible without causing nausea. Much nourishment was, of course, lost, because of the paroxysms of coughing and vomiting. Four days after the operation, the dressing was changed, and the sutures and tubing removed. There was considerable drainage of pus. The patient's general condition improved, the wound was dressed daily for three weeks; at the end of that period the drainage had stopped. The wound granulated in slowly, and healed three weeks later.

Ten months afterwards, the child was examined. Her chest expansion was symmetrical, there was no deformity present, as she could fully extend both arms above her head, and in all directions. New rib had grown into the bony defect, and her chest was otherwise negative. Her weight was thirty-eight and one-half pounds. She had measles a few months previously, otherwise she had been in excellent health.

### CONCLUSIONS.

1. In such complicated infections of the chest, novocaine is the anesthetic of choice, injected locally and paravertebrally. Ether, chloroform, or other general anesthetics are distinctly contraindicated.

2. An indirect opening into the pleural cavity is infinitely preferable to a direct one, because in the latter case, air rushes in and out of the chest continually, with each respiration. This causes partial lung collapse, which, in turn, favors cavity formation and chronic empyema, as the lung cannot fully expand.

3. A valve fashioned from the soft tissues themselves is more efficient than any mechanical valve.

# Medical Progress

## RECENT PROGRESS IN NEUROLOGY.

By Isador H. Coriat, M.D., Boston.

### ORIGIN AND NATURE OF MULTIPLE SCLEROSIS.

Two theories have been utilized to explain multiple sclerosis: first, that the disease is a vascular disorder of inflammatory origin, and secondly, that it is produced by an infectious agent. Marinesco (*Revue Neurologique*, June, 1919) is of the opinion that the nerve lesions are secondary to the vascular. The sclerosis is localized more in the white substance than in the gray, and in the white substance there is an overgrowth of neuroglia. It is only in the acute cases that the nerve cells are actually affected. There is a marked perivascular inflammation, principally by lymphocytes, plasma cells and mastzellen. Polynuclears and eosinophiles are rare. Rod cells also may be present, a feature which shows the relationship of this disease to neurosyphilis and paresis. As there may be a ventricular inflammation, the cerebrospinal fluid may contain the pathogenic elements of the disease. The disease is not of syphilitic origin, either clinically, histologically or serologically. Some writers have described a spirochete in the blood and cerebrospinal fluid of the disease. The transmissibility of the pathogenic agent of multiple sclerosis through injection into animals of the cerebrospinal fluid from subjects having the disease, has been confirmed by several investi gators, and in rabbits there could be produced a motor disorder with death from paralysis. The blood of these injected animals has shown the presence of a spirochete.

In Marinesco's experiments the cerebrospinal fluid from two subjects having typical multiple sclerosis, was injected into six guinea pigs by the intradural, intracerebral and intraperitoneal routes. In the two intradural cases, there developed three or four days after the injection, motor disorders and weakness of the limbs. The cerebrospinal fluid in these cases showed a large number of active spirochetes by means of the ultra microscope. In the injections by other routes no symptoms were produced and the presence of spirochetes could not be demonstrated.

(While these experiments of Marinesco are not convincing, yet they are a step in the right direction, provided one is inclined to accept the infectious origin of the disease. A definite position on this latter cannot be taken, but since multiple sclerosis is a disease of adolescence or young adults, it appears that Adler's conception of organ inferiority, when applied to the central nervous system may explain the puzzling etiology of this disease. The disease is not syphilitic in origin, as the Wassermann reaction in the blood and spinal fluid are negative, and the cell count within normal limits.)

### TREATMENT OF CAUSALGIA.

Lewis and Gatewood (*Journal American Medical Association,* Vol. 74, Nov. 1, 1920) call attention to one of the most distressing complications or sequellae of peripheral nerve lesions. It was first observed by Weir Mitchell during the Civil War. Its predominant feature is persistent pain, probably due to an ascending neuritis in the injured nerve. Four cases were observed among 550 cases of peripheral nerve injuries. Three of these patients were operated on and cured by intraneural injections of 60% alcohol. These injections seem to interrupt the conduction of sensory impulses, but do not interfere with transmission of motor impulses; the motor palsies, when they do develop, are transitory and show rapid recovery.

### WOUNDS OF THE CEREBELLUM.

This interesting and remarkable monograph, by André Thomas (1918), deserves a more extended notice than can be given within the limits of an abstract, as it shows the results which may be obtained in neurology by sound and thorough clinical observation. With Tinel's "Nerve Wounds," it will remain as one of the outstanding French contributions to the neurology of the war and upholding the best traditions of the neurology of the French school. Only three cases were studied, but the cerebellar wounds in each were so localized as to make the conditions comparable to the experimental destruction of the cerebellum in animals.

These three cases were made the subject of extended and careful clinical observations, not only by means of the usual tests for cerebellar lesions and for disturbances of equilibrium, but the monograph is illustrated by excellent moving pictures of the application of the various tests for muscle tonus, ataxia, and passive and active muscular movements.

In a study of the knee-jerk on the affected limb, on the side of the lesion, the author points out that the leg, instead of immediately returning to its condition of repose, tends to remain hyper-extended in a series of oscillations. The same phenomenon has been seen in chorea and when we recall how often chorea resembles a cerebellar lesion, the analogy is interesting if not altogether convincing. It was shown that the adiokokokinesis test, on which Babinski lays so much stress, is characterized by the rapidity of certain movements and the slowness of others, and that dysmetria plays an important part in the phenomenon. All the cases showed a defective association of muscular movements known as asynergia. Nystagmus existed in all the cases.

After a long discussion of the normal and pathological physiology, the relation of Barany's work to cerebellar lesions, and the data of cerebellar localization, the following conclusions are drawn: The symptoms in these three cases studied were the same, but of different distribution, according to the nature and site of the lesion. All the symptoms were homolateral. The nearly complete inertia of one of the lower limbs in one of the cases and the fact that one of the upper limbs was involved, is a proof of definite cerebellar localization. In two cases, the disorder of equilibrium disappeared when the lesion was at a distance from the vermis, while in one case the disturbance of equilibrium persisted when the vermis was involved, a most convincing proof of the importance of this region in the regulation of the equilibrium and attitude of the body. There could be determined the existence of special centres for muscular movements, the same as in animals where the cerebellum has been partially destroyed.

### EPIDEMIC ENCEPHALITIS.

Three papers on this interesting disease by Bassoe may be considered together. The first paper (*Journal American Medical Association,* April 5, 1919) gives in detail the clinical histories of twelve cases, in two of which complete autopsies were performed. The brain changes were very similar in each case. The gross changes consisted mainly of oedema, congestion and minute hemorrhages, most numerous in the brain stem, basal ganglia and centrum ovale. The histopathological changes consisted principally of dense accumulations of mono-nuclear cells around the vessels and of small hemorrhages. Outside of the classical symptoms, certain anomalous clinical features were noted, such as muscular rigidity and slow movements resembling katatonia and advanced Parkinsonian rigidity, and a sort of pseudocerea flexibilitas. The early occurrence of lethargy points to its being a focal symptom rather than an expression of intoxication of the higher brain centres. A careful study of the symptoms and lesions of this disease may help to throw a valuable side light on such disorders as paralysis agitans, chorea, Wilson's disease (progressive lenticular degeneration) and perhaps even dementia praecox. The spinal fluid showed a slight increase in monoculear cells. Cultures of the blood and spinal fluid were negative. The second paper by Bassoe and Hassin (*Archives of Neurology and Psychiatry,* July, 1919) is devoted exclusively to the histopathology of the disease. The following conclusions are drawn:

1. The pathologic changes in epidemic (lethargic) encephalitis involved the entire central nervous system.

2. These changes are both parenchymatous and interstitial.

3. The former principally involved the cortex, the latter the peduncles, internal capsule, lower pons, bulb and cord. In the basal ganglia and midbrain both parenchymatous and interstitial changes are pronounced.

4. In its histopathology epidemic (lethargic) encephalitis differs from the various types of hemorrhagic encephalitis, but it is identical with that of African sleeping sickness (trypanosomiasis).

5. It differs from typical cases of paralytic dementia by the topography of the lesions and by the absence of vascular wall changes which are probably due to the more chronic course of the latter.

6. It also differs from the various types of traumatic and experimental encephalitis and from acute anterior poliomyelitis.

7. It is pathologically a distinct morbid entity, a disease *sui generis,* and does not resemble the conditions previously described as influenzal encephalitis.

8. The similarity between the pathologic changes in African sleeping sickness and epidemic encephalitis suggest a close relationship of their etiologic factors, that is, the epidemic encephalitic may be caused by a parasite akin to a trypanosome. In Bassoe's third paper (*Journal A.M.A.,* April 10, 1920) cases are reported in which the characteristic lethargy is lacking. On the contrary, symptoms akin to a general infection, suggestive of typhoid or acute miliary tuberculosis, or even to a severe acute chorea, were observed. Among the new symptoms the twitching of the abdominal muscles were also observed. Focal symptoms, such as aphasia and transitory hemiplegias were seen in some cases, while pain in the extremities was a marked feature in other cases, the latter probably produced by meningeal irritation or by irritation referable to the spinal or cranial nerve roots.

The mental disturbances in lethargic encephalitis are discussed by Abrahamson (*Journal Nervous and Mental Disease,* Sept., 1920). In the somnolent state, the answers are short but coherent and show no loss of either memory or orientation. After a reply, the somnolent state is resumed. Requests for single movements are obeyed, but there follows a relapse into the somnolent immobility. The somnolence gradually disappears and is followed by a period of mild depression. Sometimes the somnolence may deepen into a stupor. There is complete lack of emotional expression, the features are mask-like, and the muscular symptoms of a katatonic stupor may make their appearance. Sometimes the stupor state may pass away and leave a confusion, disorientation, and a memory disorder of the Korsakoff type. We are practically ignorant of what passes in the trance of lethargic encephalitis, as what is disclosed of it is usually too fragmentary for analysis.

(So many features of a negativistic stupor enter into the mental state of the lethargic encephalitis, that in young people there is frequently great difficulty in differentiating the condition from dementia praecox.)

### LUMINAL IN EPILEPSY.

Julius Grinker (*Journal American Medical Association,* Aug. 28, 1920) summarizes his experiences on the therapeutic value of luminal in epilepsy as follows:

Luminal in small doses, from 1½ to 2 grains, once or twice daily, has been found capable of causing an arrest of convulsions in epilepsy.

Larger doses than those mentioned are seldom required, but may be safely given.

Larger doses may be administered when beginning treatment, especially after sudden withdrawal of the bromide treatment; even in such cases, the dose may be gradually reduced to what constitutes an average dose, namely 1½ to 2 grains.

No harmful effects have thus far been observed from the long-continued administration of the drug.

It does not appear to be a habit-forming drug.

The effect on the mentality of patients taking luminal for epilepsy was surprising. Patients receiving average doses of luminal do not show the peculiar mental torpor of those taking bromides.

(Of course the antispasmodic action of luminal is merely symptomatic in either reducing the convulsions or causing them to cease. Even after the convulsions in epilepsy have been controlled, this does not cure the disease; for the essential character make-up of the epileptic remains and the definite conflicts which precede the seizure episodes may be still present.

The best-treatment of so-called essential or idiopathic epilepsy is a combination of the dietetic-hygienic regimen, plus the analytic reeducation of the patient from the standpoint of the character traits of the individual patient.)

### TRAUMA IN PARESIS.

Under the title of "Trauma and other Non-Luetic Influences in Paresis" (*Journal Nervous and Mental Disease,* Aug., 1920), Osnato enters at length into a subject of great importance, particularly from the medico-legal standpoint. After reviewing the various authorities on the subject, both before and since the specific serology of paresis was definitely known, he draws the following conclusions:

1. There are undoubted acute and chronic pathological lesions of the brain ascribable to trauma of the head with or without injury to the vault or base of the skull. The early results of the injury are due to hemorrhage and laceration or destruction and edema of the brain tissue; the latter results are due to gliosis and sclerosis of the nerve cells. These latter pathological changes produce the so-called traumatic insanity. The earlier symptoms produce focal paralytic lesions or simple concussion.

2. The symptoms and pathology of traumatic insanity are similar in some degree to those of paresis. This statement refers more particularly to the memory and intellectual defects and the pathological reaction of the ectodermal elements of the brain.

3. It appears from the evidence submitted above, that cerebral syphilis of the paretic type develops when something happens to change the permeability of the blood vessels of the brain, thus allowing the spirochetes and their toxins access to the brain tissue. Trauma of the brain may, therefore, by causing vascular injury or brain destruction, be followed later by gliosis and nerve-cell sclerosis, allowing first the spirochetal invasion, and later adding to the gliosis and sclerosis of nerve cells which also are an integral part of the paretic brain pathology.

4. It would appear from clinical cases submitted, that certain cases of paresis have been acutely precipitated and others adversely influenced by cranio-cerebral injury.

5. Other toxic disturbances, such as the toxins of influenza infections, alcohol and ether, may have an influence similar to trauma in the production of precipitation of paretic neurosyphilis in an individual already suffering from cerebral or general syphilis.

6. The question of the effect of emotional stress and bodily and mental fatigue on the production of precipitation of paresis must be left for further investigations.

7. The responsibility of any given injury to the head occurring in a non-paretic syphilitic must be absolute if the paretic signs follow the injury and disable the patient soon after.

8. In order to lay the responsibility for such an occurrence upon any given injury, it is impossible to use the period of latency as an absolute criterion of responsibility, because even in ordinary traumatic insanity, this period during which the pathological processes are occurring which are responsible for the later chronic mental symptoms, may be indefinitely prolonged.

9. It would appear to be indicated that any

syphilitic suffering from a trauma to the head, with possible cerebral injury, should immediately be given prolonged rest and active intensive anti-syphilitic treatment with a view to killing as promptly as possible any spirochetes which may have gained entrance to the brain substance. In order to favor the production of this result, the anti-syphilitic treatment should be begun immediately after consciousness is recovered and acute symptoms of shock due to the injury have disappeared.

10. One must be prepared for a possible paretic reaction following infections and prolonged etherization in a known syphilitic.

## Book Review.

*George Miller Sternberg: A Biography.* By Martha L. Sternberg. Chicago: American Medical Association. 1920.

In the publication of this biography of General George Miller Sternberg, written by his wife, Martha L. Sternberg, with an unusual grace and charm of literary style, the American Medical Association has made available for the profession, a book of especial historical and scientific interest. The story of Dr. Sternberg's life and achievements records a noteworthy episode in the history of medicine, that of the conquest of yellow fever, the successive stages of which were taken up in turn by three medical officers of the United States Army,—the first, General Sternberg, followed by Walter Reed and General William C. Gorgas. The biography narrates incidents in Dr. Sternberg's early life and records his activities in the Civil War, his subsequent studies and experiences in civil and military life, and his work in scientific research.

Dr. Sternberg entered the Army in 1861 as a surgeon with the Union forces, and served throughout the Civil War and in the Indian campaigns, notably the Nez Perces War. In the course of his tours of duty at eastern and southern military posts, he acquired valuable experience in combating cholera and yellow fever. He was the pioneer in bacteriology in the United States; he discovered the pneumococcus in 1880, and was the first in this country to demonstrate the organisms of malaria, cholera, and tuberculosis. The practice of modern disinfection is based on Dr. Sternberg's researches on the value of commercial disinfectants, the study of which he began in 1878 at an isolated frontier army post. Under the same inauspicious surroundings he also invented a heat regulator, modified and elaborated forms of which are today in general use for the thermostatic control of heating apparatus.

As Surgeon-General, Dr. Sternberg directed the medical activities of the Army during the Spanish-American War, founded the Army medical school, organized the nurse corps and the dental corps and established many military hospitals throughout the United States, including the tuberculosis hospital at Fort Bayard. By the establishment of laboratories and by personal encouragement, he inspired medical officers of the Army to engage in research. Many scientific investigations were conducted during his term as Surgeon-General, the most important of which related to tropical diseases, typhoid fever, and yellow fever. During the Spanish-American War he recommended the appointment of the Typhoid Fever Board composed of Major Walter Reed, Major Victor C. Vaughan, and Major Edward O. Shakespeare, and suggested the searching investigation of typhoid fever in the military camps which led to the formulation of adequate measures of prevention.

From the time of his first experience with yellow fever at Governor's Island, New York Harbor, Dr. Sternberg's interest in the subject never abated. He fought several epidemics of the disease in the cities and military posts along our coast and, himself, suffered a severe attack of the disease. He was a member of the first Havana Yellow Fever Commission, the appointment of which was the immediate outcome of the wide prevalence and great mortality of yellow fever in 1878, and he made exhaustive studies of the disease in Cuba, Mexico, Brazil, and other tropical countries. One of the most brilliant discoveries in the history of medicine resulted from his appointment of the Yellow Fever Board, under Major Walter Reed, in May, 1900, which by human experimentation proved conclusively that yellow fever is transmitted by mosquitoes. The practical application of this discovery resulted in the eradication of yellow fever from Havana and contributed to the successful building of the Panama Canal.

After his retirement from the Army, Dr. Sternberg devoted his efforts primarily to the improvement of housing conditions among the laboring classes in Washington, and to the prevention of tuberculosis. He was the author of a manual of bacteriology and of several other works on malaria, immunity, serum therapy and infection. Dr. Sternberg was the recipient of many honors during his lifetime, among which was his election in 1897 as president of the American Medical Association. This biography records the achievements of a leader among American physicians, of a pioneer among American army surgeons in the study of bacteriology, of a man whose clear thinking, devotion to duty, and untiring industry made possible some of the most significant discoveries in the history of medicine.

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## BRIEF SUMMARY OF THE ANNUAL CONGRESS IN CHICAGO.

The annual congress in Chicago March 7, 8, 9, and 10, for the consideration of the problems relating to Medical Education, Licensure, Hospital Service and Health, was attended by a Delegation on Medical Education, Council on Health and Public Instruction, The Association of American Medical Colleges, the Federation of State Medical Boards, and The American Conference on Hospital Service.

The greatest interest was concentrated on the development of specialists by the courses conducted by the medical schools, and the relation of the work of specialists to that of the general practitioner. Generalized summaries of the problems involved, were presented by Dr. Arthur Dean Bevan and Dr. Frank Billings. It was evident that the questions involved are important and have led to a degree of unanimity among the leaders of the profession. Both Dr. Bevan and Dr. Billings spoke clearly and positively of the necessity of maintaining the function and dignity of the well-trained general practitioner and that the training of the specialist should not be only for the development of the best service of the people, but also to promote cordial and coöperative relations with the general practitioner. It was estimated that, taking for example a community of one thousand people, ninety per cent. of the medical service should be rendered by the general practitioner and that in order to equip him for the work, the medical schools should concentrate more largely in carefully instructing students in the fundamentals of general medicine, general surgery and obstetrics, and further, that during the regular medical course of four years, the student's mind should not be overburdened by requirements involving the expenditure of much time on specialties. Rather that he should acquire a broad general conception of medical practice and have a thorough training in the application of standardized procedure. One very significant statement was made that the teaching of obstetrics in the average medical school was inadequate and alarm was expressed that, unless an occasional survey both of the aspect of the profession and the needs of the people, and as a result of this survey false quality and quantity of service corrected, the tendency to State Medicine would grow.

The profession was advised to meet this implied demand and the suggestion offered that, unless the profession enters the study and provides the remedy, the public will do so.

If there is foundation for this contention, the challenge is a real one. There is a suspicion amounting almost to conviction upon the part of those whose interest has been aroused, that the profession is on the defensive. It has never organized, and one may be pardoned for intimating that up to the present time there has not been shown constructive and coördinating criticism of the subjects offered for the better service of the people. There was a concurrence of opinion that the medical schools should postpone teaching of specialties until after the completion of the regular four years' course, lest the allurements of spectacular exhibitions dissipated the interest of the student in fundamentals; and, furthermore, that the teaching of specialties should be sufficiently thorough to lead to the elimination of the pseudo-specialist often recruited from the ranks of the general practitioner. Such men sometimes learn the technique of a simple operation and then blossom out as specialists without having studied the pathologic, associated tissue and functional changes, and hence are inadequately equipped to be of real assistance to the general practitioner.

It was generally agreed that there are two classes of men who can be developed into specialists: first, the graduate who enters upon the study of his selected department, and second, the general practitioner who, after a few, but not many, years of work, sees that his interest and capacity promises possibility of efficiency. Each class should spend the requisite amount of time in post-graduate study, varying from a year and a half to three years, according to the scope of the specialty and, taking surgery as an example, serve as an assistant to a recognized authority.

The question of the advisability of granting university degrees to specialists was considered and a divided opinion expressed. The major opinion seemed to be that nothing more than a certificate of service should be given, save to those men who have attained distinction through meritorious and original work.

The paper of Dr. J. Whitridge Williams was of special interest to Massachusetts men, for his statements definitely sustained the deductions of the State Commission appointed to consider Maternity and Child Welfare. He emphasized the statistical demonstration that the mortality incident to childbirth is greater in American than in any other civilized country, that out of every 30 births in America, one woman dies, and that the mortality of childbirth in Great Britain is one half, and that in Scandinavia one third of that in this country.

In a personal interview with the writer, he stated his convictions that syphilis, tuberculosis, midwives, and the living conditions of women in this country, tend only slightly to this high mortality, and the remedy lies in the better teaching of obstetrics in the medical schools.

If this means anything, it means that the practice of specialties, like that of some other departments of medicine, must be better conducted. Here again the profession should show interest and, since the subject has been placed before the people of the State, the solution of the problem should lie with the profession, and be dealt with before the laity takes it up. May not the well-equipped obstetric specialist be as useful to the general practitioner as is the eminent surgeon to the average surgeon? Why should the general practitioner be sensitive and resentful because of the study made and the conclusions drawn relating to this subject?

The interest relating to licensure, centered about state reciprocity recognition of the decisions of the medical board and the chiropractic invasion. Dr. Horace D. Arnold represented the National Board and gave a complete exposition of the methods endorsed and used by that board. These matters do not seriously affect this state, because the Massachusetts Board exercises the utmost courtesy toward well-qualified men from other states seeking registration here, and gives credit for years of practice and good standing, so that well-qualified men uniformly secure registration without any great hardship. The Board also practically recognizes the decisions of the National Board and only requires of candidates approved by the National Board, an examination barely sufficient to meet the technical requirements of the law.

The chiropractic question is not at present important in this state, because the college created by one J. Shelby Riley, now or late of Washington, D. C., was put out of business by the Massachusetts Court and the exponents of the cult have been prosecuted and convicted. It is quite probable that no chiropractic school meets the requirements of this state, and hence no graduates have applied for examination.

The discussion of the technical aspect of medical education, hospital administration, and public health, will be of greater interest to specialists in these various fields, rather than practitioners, and will be studied by those especially concerned. These papers will be later printed in full in the *Journal of the American Medical Association.*

It was a pleasure to meet Dr. Hugh Cabot, and hear his comprehensive paper relating to the teaching of surgery in the medical schools and his recommendation for further progress.

* * *

The next annual meeting of the Massachusetts Medical Society will be held in Boston, Tuesday, May 31, and Wednesday, June 1, 1921.

## MEDICAL NOTES.

Sewage Disposal in the Country.—A system by which an isolated dwelling (or small group of buildings) having running water may dispose of sewage safely and at small cost, is recommended by the U. S. Public Health Service in one of its recent weekly reports.

The chief feature of the system, which has been in successful operation in New Hampshire for summer cottages and hotels for ten years, is a rectangular septic tank, of concrete, with a minimum capacity of 94 feet. This will serve 20 people; four cubic feet additional should be provided for each additional person.

The tank should be buried under twelve to eighteen inches of earth, as near as practicable to the house, with which it should be connected with piping. The effluent from this tank which contains organic matter that might be quite objectionable and even dangerous, is commonly best disposed of by some sort of subsurface irrigation whose exact form will necessarily be governed by the nature of the soil. Full details are given in the report.

Before installing such a system, however, the State health authorities should be consulted, especially in the limestone sections of the country, where care is necessary to prevent the contamination of springs and other underground waters.

### BOSTON AND MASSACHUSETTS.

Health Statistics in Boston.—Health Department officials are very much interested in a case of actinomyosis at the South End. The disease is rare and the last case was reported about six months ago. The patient, in this instance is a young girl who was operated on for appendicitis, that being indicated in the first diagnosis; but the thick discharge, so characteristic of actinomyosis, persisted, and further examination disclosed the fact that she had that disease.

Deaths in Boston, week of March 5, numbered 217. Though 60 cases of diphtheria were reported, only two deaths resulted. The regulations issued by the State Department of Health, insisting on the reporting of encephalitis lethargica, as suggested by Dr. William C. Woodward, Health Commissioner, brought out the fact that nine more new cases of the so-called sleeping sickness are known. This increased the total to 43. There was only one death. The total deaths since the first of the year thus increased to 12.

Of the total deaths, 120 were females and 97 males; 86 were over 60 years old, while 41 were under five years of age. Thirty were infants or less than a year old, and 37 were under the age of two years.

Tuberculosis reached its highest point this winter and claimed 21 victims. Heart disease had 36 and cancer 18. There were ten deaths from broncho-pneumonia and 13 from lobar pneumonia. There were 12 deaths due to accident or violence, and 11 from Bright's Disease and nephritis. There were two deaths due to measles, one to scarlet fever, and three to whooping cough.

Election of Dr. John B. Hawes, 2nd.—Dr. John B. Hawes, 2nd, has been elected President of the Boston Tuberculosis Association. He has secured for the Association the services of Miss Bernice W. Billings, now with the New England Division, American Red Cross. The first work which the Boston Tuberculosis Association plans during the ensuing year is to make a health survey of the City of Boston, as far as tuberculosis is concerned, to be able to map out the future program, to eliminate methods which have been of little value, and to emphasize methods which have shown their worth and in every way to direct the efforts of the Association towards the human and practical side of the tuberculosis problem.

Bequests to Hospitals.—By the will of the late Miss Annie Richards of Boston, the sum of ten thousand dollars each is bequeathed to the Children's Hospital, to the New England Hospital for Women and Children, to the New England Peabody Home for Crippled Children, and to the Boston Nursery for Blind Babies.

The Public Health Service and the Rutland Sanatorium. — Announcement has been made that the Public Health Service has leased the tuberculosis sanatorium nearing completion at Rutland, Massachusetts, for a term of years. It is expected that within two months the sanatorium will be able to accommodate one hundred patients and it will care ultimately for 300. The plans under which the sanatorium is now being enlarged have been approved by the Public Health Service and by the architect of the National Tuberculosis Association on duty with the service. Specialists who have been visiting the tuberculosis hospitals to see that every one of the 20,000 tuberculous ex-service patients shall have the best treatment to be had, have completed their task and have submitted their suggestions. Steps to put these into effect are already in operation in part, and will result in the Government having the very best type of sanatorium.

Week's Death Rate in Boston.—During the week ending March 12, 1921, the number of deaths reported was 229 against 250 last year, with a rate of 15.76 against 16.13 last year. There were 38 deaths under one year of age against 49 last year.

The number of cases of principal reportable diseases were: Diphtheria, 58; whooping cough, 19; scarlet fever, 80; typhoid fever, 2; measles, 85; tuberculosis, 33.

Included in the above, were the following cases of non-residents: Diphtheria, 7; scarlet fever, 8; measles, 2; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 2; whooping cough, 2; scarlet fever, 3; typhoid fever, 1; measles, 2; tuberculosis, 11.

Included in the above, were the following non-residents: Diphtheria, 1; scarlet fever, 2; tuberculosis, 1.

Encephalitis lethargica cases: 4; death, 1.

## Obituary.

### WILLIAM FISKE WHITNEY, M.D.

Dr. William Fiske Whitney died at his home in Boston on March 4, 1921, at the age of seventy years. His death was due to cerebral hemorrhage. Dr. Whitney was born in Boston. He was graduated from Harvard in the class of 1871 and from the Harvard Medical School in 1875. He then studied anatomy for three years in Berlin, Munich, and Strassbourg. Upon his return to this country he was appointed pathologist to the Massachusetts General Hospital, and the following year was made curator of the museum of the Harvard Medical School, a position which he held until the time of his death.

From 1883 to 1890 Dr. Whitney was secretary of the medical faculty at Harvard, and from 1891 to 1901 he was actively identified with the veterinary school, where he was professor of parasites and parasitic diseases. He served on the committee appointed to superintend the planning of the building of the old Harvard Medical School on Boylston street in 1880, and 20 years later served in a similar capacity to consider plans for the new group of buildings on Longwood avenue.

Dr. Whitney was president of the Boston Obstetrical Society, and since 1917 had been a vice-president of the Boston Society of Natural History. He was a member of the American Medical Association, the Massachusetts Medical Society and other organizations. He was at various times connected with the Boston Athletic Association, the Union, St. Botolph and Harvard clubs, The Brookline Country Club and the Corinthian, Eastern and Boston Yacht Clubs. He is survived by a widow and two sons, Lyman F. Whitney, Harvard '10, and William E. Whitney, Harvard, '16.

## Miscellany.

### TYPHUS FEVER WARNING.

At the present time, people are constantly coming to this country from parts of Europe where typhus fever is prevalent. In spite of the precautions of the Federal Quarantine authorities, both abroad and at our own seaports, cases of typhus fever, probably due to recently imported infection, have occurred among the resident population of New York City and of other places. It is, therefore, not improbable that cases of the disease may be found in Boston, either among recently arrived immigrants or the permanent population. In such an event, the prevention of a serious outbreak here of the virulent type of the disease, now common in Eastern Europe, may depend upon the prompt recognition of any case of the disease in this city.

Physicians should, therefore, keep constantly in mind at the present time, the possibility of typhus fever, in all cases of an acute illness with sudden onset, high temperature, marked prostration, ocular congestion, severe headache and mental apathy, in which the diagnosis may be in doubt, particularly if a dark "rose spot" or petechial eruption appears a few days after onset of illness. In any case in which a suspic ion of typhus fever arises, you are requested to notify the Health Department at once. If desired, diagnostic assistance in any such case will be promptly furnished you without charge. Should you desire such assistance, telephone Fort Hill 5100, Health Department, Medical Division, between the hours of 9 A.M. and 5 P.M., daily, and Saturday until 1. At all other times call Main 3887.

That the diagnosis of a case of typhus fever may not be easy, is indicated by the fact that typhus fever of a mild type (Brill's disease) is endemic in this country and that it existed for many years before its true character was recognized, cases being usually mistaken for atypical typhoid fever. Experience has shown also, that typhus fever may be mistaken for cerebro-spinal meningitis, pneumonia or influenza.

Since typhus fever has been seldom seen by physicians in this city, it may not be improper to remind you of the characteristic symptoms of a typical case.

*Symptoms.* The main symptoms are sudden onset with severe headache; high temperature, of 103° to 105°, and fall by rapid lysis to normal in about two weeks; pulse rapid, from 100 to 120; the tongue at first has a white coat, which rapidly becomes brown and very dry, with sordes on the teeth; bowels are constipated; delirium is a common symptom. The headache usually persists with the fever, and is frontal and severe in character. The expression is dull; eyes are congested; respiration is rapid; spleen is enlarged. The eruption usually appears on the third to the fifth day. The spots are smaller than those of measles, are distributed over the covered portion of the body chiefly, and may appear on the hands and feet, but rarely appear on the face. The spots are red at first and then of a dirty bluish color. On the third or fourth day of the eruption there is extravasation of blood into the lesions which form dark colored spots underneath the skin. The eruption becomes of a darker color as it becomes older. The eruption is one of the best differential guides.

In mild cases the symptoms described above may be so modified as to cause the difficulty in diagnosis already referred to.

Needless to say, all suspicious symptoms assume a graver aspect if they occur in a person recently arrived in this country from abroad, or in a person known to have been exposed to infection.

*Diagnosis by the Agglutination Test—Weil-Felix Reaction.* The Bacteriological Laboratory of the Boston Health Department is prepared to examine blood specimens from cases suspected to be suffering from typhus fever. This reaction, while not specific in character. is fairly reliable. The reaction appears during the first week of the disease and becomes quite marked during the second week and during convalescence.

*Directions for Taking and Forwarding Specimens to Laboratory.* Procure a specimen of blood in a manner similar to obtaining a specimen for Widal examination, using a similar outfit. Dry the specimen in the air, and forward it to Laboratory through mail or by special messenger.

*Age Period.* The disease is usually found in adults and seems to be rare in children under five years.

*Cause of Disease.* The disease is presumably due to an organism, which is to be seen in infected lice and in the lesions of the disease, but which has not yet been artificially cultivated.

*Mode of Transmission.* It has been well established that the disease is transmitted by body lice and by head lice, and apparently is not spread in any other manner. The lice become infected by feeding on persons infected by typhus fever and become themselves carriers of the disease. Where lice are abundant there is the greatest danger of the disease being spread. Overcrowding, uncleanliness, and poor sanitary conditions favor the spread of typhus fever, because these conditions are favorable for the distribution of lice from person to person.

*Treatment.* There is no specific treatment. Patient suffering from typhus fever will not be allowed to stay at home, but will be removed to a hospital. Contacts will be thoroughly deloused, together with such articles or clothing as the Health Department may deem necessary. The premises will be deloused. Contacts after delousing will be kept under supervision of the Health Department until all danger of infection has passed.

Wm. C. Woodward,
*Health Commissioner.*

## Correspondence.

### THE PREVENTION OF MALARIA.

*Mr. Editor:—*

You have shown in your editorial in today's issue, that the most effective way to prevent malaria is to destroy the malarial parasite in the blood of the carriers of it. This I have tried to show by what I have written, more than once, and especially during the last year.

There are two medical agents which will do it, and only two. Quinine will not—at least, it will not in many instances, especially the virulent cases such as those so often taken in southern climates. Compound tincture of bark, taken frequently and in sufficient doses, will destroy the malarial germ in most instances. This is also true of Warburg's tincture. I deem it a matter of the very highest practical importance to disseminate very widely this truth. Aside from the immense benefit which would result to the health of individuals and communities, the saving of millions of dollars to the United States and, indeed, in every country where malaria shows its fearful ravages, is, to my mind, unquestionable. I beg that you will emphasize, forcibly, my affirmations and, if you desire, will give you the references precisely of what I have written previously on the subject. Among them I would now cite the following, which have appeared lately. In the *New York Medical Record* of December 11, 1920, you will find "When quinine and even the combined alkaloids fail to do good work in curing malaria, the compound tincture of bark will, I believe, do the trick and bring to a rapid end all evidences of malaria so far as symptoms are concerned, and also at times, any evidences that can proceed from laboratory research." In November, 1920, issue of the *American Journal of Clinical Medicine*, page 763, I affirm as stated above and deplore "the neglect into which two of the old-time remedies have fallen, namely: Warburg's tincture and compound tincture of bark." The last textual quotation is from the editorial in the January, 1921, issue of the *American Journal of Clinical Medicine*.

Beverley Robinson, M.D.

New York, March 2, 1921.

### AN EARLY SUCCESSFUL GASTROTOMY.

*Mr. Editor:—*

The following account is given by Baron Larrey in his Memoirs (Austerlitz, Poland, Vol. II, pp. 178, 179, American Edition, 1914).

The incident of which Larrey writes must have occurred at Toulouse between 1780 and 1787, as he was then a student there under his uncle, Alexis Larrey.

> "Authors give a great number of cases in which foreign bodies of large volume have been introduced into the stomach, and have been discharged per anum, or have made their way out spontaneously; but do not speak of operations on this viscus for the purpose of extracting foreign bodies that have lodged in this organ and produced alarming symptoms.
>
> "I remember, while a pupil with Mr. Frizac, professor of the college of Toulouse, one of the most dextrous surgeons of that city, that I saw him operate on a porter, by making an incision in the epigastric region, parallel with the linea alba, through which he discovered the point of a knife blade that had perforated the coats of the stomach. He seized the point with a pair of strong forceps, enlarging the opening with a curved bistoury, and took out the fragment, which proved to be about two inches in length. He then put two sutures into the lips of the incision of the stomach, and an interrupted suture in the integuments. This porter recovered. Threads of different colors were used in the sutures, and on the fifth day the wound of the stomach had united, no doubt by adhering to the peritoneum."

In regard to this subject, Larrey also states:

> "At Königsberg, we also saw a small knife which a farmer, named Andreas Guenheid of Ancient Prussia, had swallowed in 1613. The violent symptoms which ensued induced Dr. Gruger, a Polish surgeon, to perform gastrotomy upon him. It was done on the twenty-ninth of May of the above year, and he lived afterward ten years."

Very truly yours,
William Pearce Coues, M.D.

31 Massachusetts Avenue, Boston,
March 7, 1921.

## SOCIETY NOTICES.

The Norfolk District Medical Society.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, March 29, 8.15 p.m. Telephone, Roxbury 56089.

Business; Communication, "The X-ray Diagnosis of Phthisis," illustrated, by Frederick W. O'Brien, M.D.; Discusion by Arial W. George, M.D.

Bradford Kent, M.D., *Secretary.*

Brooklyn Cardiological Society.—The third meeting of the Brooklyn Cardiological Society wll be held at the office and residence of the president, Dr. William J. Cruikshank, 102 Fort Greene Place, Brooklyn, New York, on Thursday evening, March 31, at 8.30 o'clock.

PROGRAM.

1. Presentation of patient demonstrating the beneficial effects of physical exercise in the treatment of valvular disease. Dr. Cruikshank.
2. Paper: "The Effects of the Vagus Nerve on the Heart Beat." William W. Laing, M.D.
3. Discussion: Dr. Robert Hurtin Halsey, Manhattan; Dr. Walter Timme, Manhattan.

General discussion.

W. J. Cruikshank, *President,*
William W. Laing, M.D., *Secretary.*

## RECENT DEATHS.

Dr. Clarence Albert Pettengill died on February 24, at his home in Wellesley Hills, at the age of 45 years. His death was caused by double pneumonia. Dr. Pettengill was born in Middletown, Conn., the son of Dr. Joel M. Pettengill, a dentist, and Emily (Parker) Pettengill. He was a graduate of Tufts College in 1900 and of the Tufts Dental School in 1903. Since that time he had been practising dentistry in Boston. At one time Dr. Pettengill was head of the prosthetic department of Tufts Dental School. In 1911 he married Miss Helen Ramsay of Cambridge, by whom he is survived. His parents also survive him. Dr. Pettengill was a member of a number of dental societies.

William Fiske Whitney, a Fellow of the Massachusetts Medical Society, died, of cerebral hemorrhage, at his home in Boston, March 4, 1921, aged 70 years.

Dr. Amasa Howard, a Fellow of the Massachusetts Medical Society and a native of Chelmsford, died in that town March 3, 1921, aged 63 years. He was a graduate of Dartmouth Medical School in 1882 and had practised in Chelmsford all his life.

The Boston Medical and Surgical Journal

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## Address.

### THE RAT IN HEALTH AND ECONOMICS.*

By Mrs. Albert T. Leatherbee,

*Ratologist, Women's Municipal League of Boston.*

The story of the rat is a big story and a long story, and covers a large field in health and economics. For some years it has, unfortunately, been the general custom to regard rats as a joke and the word has been used as a slang phrase of derision and contempt. But it is time now for the public to wake up to the fact that rats are no joke and that they are a very serious menace to humanity. It is time for self-respecting citizens to get together and exert themselves to destroy this pest. Is it possible that rats are more intelligent than men? It would almost seem so when we consider that it is only through human negligence and support that they exist. Rats live on the products of man's labors. They eat the food he has provided for himself. They destroy the property which he wishes to enjoy, and they live in the homes and buildings which he has constructed for his own use. Were they deprived of all these comforts, they would rapidly disappear. But just as long as human beings regard them with apathy, and furnish them with domiciles and food, rats will increase and multiply until finally they will become equal rivals for existence with man and may possibly conquer him.

This statement may, at first, seem very wild, but already the rat population not only equals, but exceeds the human population in this country, and the fecundity of the pest is terrific. Females breed at the age of three months; they have from six to ten litters a year and these litters number from eight to eighteen. The period of gestation is only twenty-one days. And the better fed and the better housed the rats, the oftener they breed and the larger the litters. Federal authorities compute that a healthy pair of rats, provided all progeny live, will be accountable for 800 descendants within one year.

At present prices, it costs about two cents a day to feed a rat. Therefore, on conservative estimate of one rat to one human, the rat population in this country is over 100,000,000 and the cost of feeding them may be figured at $2,000,000 a day, or $730,000,000 per year, besides the damage they do in the destruction of property. The federal authorities place this at about another $200,000,000 annually, and the constant labor of 200,000 men is required to produce the materials destroyed by rats. It is unthinkable that civilized people should rest supinely under such conditions.

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* Address to Boston School Physicians.

Rats are omnivorous. They eat all prepared foods of men, meats, grains and vegetables. They even attack seeds planted in the ground and climb trees to eat their fruits. They enter stores and warehouses and destroy all sorts of merchandise. They enter libraries and chew books and bindings. They gnaw water pipes and cause floods. They gnaw insulation from electric wires and produce fires. And yet people smile when we talk of rats!

Three kinds of rats abide in this country today. None of them are native, as our indigenous rodents, such as gophers and squirrels, are of a different species. All are emigrants from the Old World and most undesirable immigrants which should be barred entrance.

The three imported species of rats are: the Mus rattus, or black rat; the Mus alexandrinus, or roof rat; and the greatest and most dangerous pest of all, the Mus novegicus, although it is a libel on Norway to have so named him. This latter species is commonly known as the brown rat, the wharf rat, the sewer rat, the gray rat, the barn rat, etc.

Mus rattus is somewhat smaller than his cousin, Mus norvegicus, who kills and eats him at all opportunities, and has practically driven him out of this section, although this species is constantly arriving on incoming European ships.

Mus alexandrinus lives largely in buildings, dwelling in walls of houses and between floors and ceilings. He also finds it hard to exist in the presence of Mus norvegicus, except in the southern states, where the climate permits him to live and nest in trees.

But of all bad rats, and all rats are bad, Mus norvegicus is the worst. He lives everywhere, and no other animals are able to exterminate him, because he is fed, protected and housed by man. While he is of a burrowing species and naturally finds his abode in the fields and along the banks of streams, he has quickly learned that he can live at greater ease and without exertion in the buildings erected by man. Therefore, while many do infest ground burrows all the year round, others live in the fields during the warm months and then abandon their natural habitat to invade houses and barns during the winter, while others live in such places constantly.

Like most of the plagues of the world, they are of Asiatic origin, and probably originated near the locality of the old Garden of Eden. They emigrated from Asia along in the early middle ages and rapidly spread over Europe. In 1714 they crossed the channel to England, and are supposed to have taken passage on the very ship that carried King George to the British throne. For this reason our English cousins, who did not love their German dynasty, named them Hanoverian rats. Sometime about the middle of the 18th century, English ships brought them to the colonies and they rapidly spread along the Atlantic coast and gradually westward. By 1870, they had reached the Mississippi, and by 1900 they had covered the entire North American Continent.

An exodus of these animals from cities and villages to river banks and farmsteads in the surrounding country takes place every spring, and is followed by a return migration each autumn. This explains why rats are more abundant in towns during the cold season, while in the country they occur in largest numbers during the summer months.

The city is the great stronghold of the rat—its permanent refuge, and its last line of defense; for the institutions peculiar to large cities favor the rat and account for its abundance. The old wooden wharves, the extensive lumber yards, the large markets, the ancient factories, the grain elevators, the railway terminals and freight yards with many other features, attract and harbor these rodents.

A city sewer system is a permanent abode and also a most convenient and extensive highway for their travel from one point to another, while old, broken and abandoned sewer pipes offer a runway for rats into basements.

Rats migrate from places where food is scarce to places where it is plentiful; and abundant food in a new locality causes an abnormal reproduction, the effect of which in a short time is that of a sudden invasion of a vast horde of rats. All means of travel known to man were rapidly seized by these pests, but the introduction of railways and the use of freight cars accelerated their movements to an unprecedented degree, and the extension of water commerce has aided them greatly. No ships are free from travelling rats, and few freight cars are clear of them. If you doubt me, visit the waterfront or the railway yards and see for yourselves.

To eliminate the rat and safeguard our lives and property, we must prevent immigration, through inspection and killings on wharves and in freight yards; enforce rat-proofing laws in our buildings; and see that food is kept inaccessible.

I am not going to take up your time this morning by going into details by which these things may be accomplished, but shall confine my remarks more especially to the medical phase of the subject, which is very important, and whose importance is neither realized nor appreciated, either in the profession in general or by the laity.

Rats are great spreaders of disease. As fur-bearing animals, they frequent the dirtiest places,—sewers, garbage dumps, stables, etc. Their bodies are covered with fleas and with germs of all kinds, which they bring into our homes and scatter about our pantries, and carry into our markets to disseminate about our food supplies. Aside from such germs as may abide in the fur, the rat is the known carrier of two diseases, trichinosis and bubonic plague, and is suspected of a third, leprosy, although it has not to date been proved that rat leprosy and human leprosy are interchangeable. No epidemic disease has been so fatal to man as bubonic plague, which is characterized by swelling of the lymphatic glands nearest the point of inoculation into large and painful tumors called "buboes," which generally occur in the groins and armpits. The mortality is very high, generally ranging around 95 per cent. Our English word, "plague," and the German "plage" are derived from the Latin "plaga,"—a blow,—while the French "fleau," meaning "flail," conveys the same idea. In fact, all terms for epidemic pestilence in all languages, European or Oriental, are derived from such sources.

In trying to outline the bubonic plague from the earliest times, we are immediately confronted with the difficulty of distinguishing true Oriental plague from other epidemic diseases that afflicted humanity at various periods. In ancient and mediaeval writings of every people, we find narratives of pestilence, but whether these afflictions were those of true bubonic plague, typhus, syphilis, smallpox, cholera or other disorders, it is difficult to determine unless we find mention of the presence of buboes —the characteristic sign.

It is especially difficult to distinguish epidemics of typhus from those of plague, as their confusion has prevailed down to comparatively modern times, even among medical writers, - undoubtedly due to the fact that the two diseases have been often commingled in one and the same epidemic, which is no great cause for surprise when we remember that plague is propagated by fleas, and typhus by body lice. We find such commingling in the epidemics of 1568 in France; of 1624-5 in London; of 1636 in Holland; of 1720 in Marseilles; of 1760 in Aleppo; and 1771 in Moscow.

Probably the earliest record we have today of a plague epidemic is that recorded in I. Samuel, chapters 4, 5 and 6, where we read that the Philistines, having crushed the Israelites and captured the ark, carried it off to Ashdod, for which sacrilege Jehovah smote them with seven months of pestilence, which was only terminated by the return of the Ark and the offering of *five golden emerods* (bubonic tumors) and *five golden mice*, thus showing the recognition of the part played by rodents in dissemination of plague.

The plague of David, recorded in II. Samuel, Chapter 24, which killed 70,000 in three days, may have been bubonic, but there is nothing in the record to distinguish it as such, despite the fact that Pierre Mignard's celebrated picture, done in the latter part of the 17th century, has a stricken physician in the foreground lancing a bubo.

So, from lack of explicit information as to their character, we shall pass over the numerous and almost continuous epidemics that ravaged Rome and her possessions from her foundation in the time of Numa Pompillius until the great plague of the 6th Century, A. D. This started in Antioch in 540, passed through Byzantium, Auvergne, Marseilles, Rome, Avignon and Strasbourg, lasting 52 years and destroying over 50 per cent. of the population.

Between the 11th and 15th centuries, Europe suffered from 30 epidemics of bubonic plague, the most celebrated being the famous "Black Death," which killed nearly 50 per cent. of the population of the known world. Originating in the north of China in 1333, it spread out in every direction, north to the Black Sea, west into India and Asia Minor, and through Arabia, Egypt and northern Africa. From Asia Minor, commerce rapidly carried it through the Mediterranean, to the great seaports of Greece, Italy and France, whence it moved northward through Germany to the Baltic and across to the British Isles. I shall not dwell upon the horrors of the terrible Black Death, but recommend to those who desire to investigate the subject, Hecker's remarkable book with its wonderful detail, and the introduction to that masterpiece of Italian prose, Boccaccio's *Decameron.* It is interesting to note that one result of this frightful epidemic was the production of many wonderfully beautiful churches and religious works of art, such as that peerless masterpiece of Sodoma, the banner of St. Sebastian, patron against pestilence, in the Uffizzi gallery at Florence; and the Sistine Madonna of Raphael,—both plague banners.

After the Black Death, the special intercessor against plague was St. Roch, owing to his having so bravely nursed the sick throughout the stricken cities of Italy, contracted the disease and given his life in this noble work. Many beautiful paintings abound of this worthy man, always representing him as showing the bubo in the groin, and generally accompanied by his faithful dog.

Despite the efforts of practical men to discover the origin and means of communication of the disease among whom we must pay all honor to that noble and broad-minded pontiff, Clement VI, who ordered autopsies at Avignon, so little were real causes recognized that the greatest superstition prevailed and all sorts of queer ideas ran rampant. The origin of the epidemic was laid to all sorts of causes—to demons, to witchcraft, to magic markings of doorways, etc., and because a majority of Christians believed that their sufferings were due to having treated the Jews with too great leniency, horrible persecutions of this despised race abounded throughout Christendom. They were accused of poisoning wells and even of infecting the air. Thousands of them were openly murdered, their houses burned, and even the bricks and stones scattered.

The ancient idea that disease was sent to punish mankind by the wrath of an offended and vengeful deity was revived among the ignorant, and the fast declining cult of the Flagellants took on new life. Taking upon themselves the repentance of the people, they marched over all Germany, Hungary, Poland, Bohemia, and Silesia, scourging themselves with thongs and offering prayers and supplications to avert the plague, stopping only one night at any place and gathering to themselves men, women, and even children of the lower orders. Finally, they became so formidable to both the secular and ecclesiastical powers that they were suppressed by Charles IV and Clement VI, and forced to go to work. Those who refused to turn from vagrancy to some useful purpose were extirpated by fire and sword.

After this fearful plague visitation, it continued to make its epidemic appearance at various times in various places, the worst invasion appearing in 1527 in Rome, which had already had four visitations and was destined to receive seven more before the close of the century. Others occurred in 1530 at Geneva; in 1576 at Milan, which had another most awful epidemic in 1630 when 150,000 died; in 1665 in London; and in 1679 at Vienna. The last great outbreak in Europe was at Marseilles in 1720, when at one time so great had been the mortality that over 2,000 dead lay in the streets, and 1,000 more rotted on the quays. There were some 90,000 deaths in all.

For fifty years Europe was comparatively free from plague until 1770, when 80,000 died at Moscow. At the same time it appeared in the Balkan peninsula with slight epidemics in Greece and Italy. It broke out in Constantinople in 1803, destroying 150,000 lives, and again in 1815, when 110,000 died.

During this period, the disease was usually prevalent in the Orient, destroying great numbers of people yearly. In 1894 there was a serious one in Hongkong and in 1896 a great epidemic broke out in Bombay with a mortality of 30,000, increasing and expanding throughout India until it reached the high mark in 1897, when some 1,200,000 natives died of it. This caused the British Government to institute investigations which led to the discovery of the method of propagation by rat fleas which was published by the Indian Plague Commission in 1898. Between 1896 and 1905, the total deaths recorded in India, officially admitted to be below the mark on account of concealment on the part of the inhabitants, was 3,157,000, of which 1,040,429 occurred during 1904.

From December, 1899, to April, 1902, plague was epidemic in Manila and surrounding territory, but, under the active operations of the authorities in killing rats and destroying rat-ridden buildings, the number of deaths was not much over 500, although the mortality of those attacked reached 91.7 per cent.

In 1900, plague appeared in San Francisco's Chinatown, where it was confined to about twenty blocks of the Oriental quarter and claimed 121 victims, mostly Asiatics. It was suppressed by the vigorous measures of the health authorities. In 1907, a second plague eruption occurred, when the disease was not confined to Chinatown, but appeared at different times in practically all parts of the city. Very few Orientals were affected, almost all of the 160 cases being white persons. This second epidemic, attacking white people, woke the city up to a realization that something must be done, with the result that a citizens' health committee carried on an active campaign, causing the destruction of 1700 buildings and the reconstruction of thousands more. The disease was rapidly communicated to the squirrels and extended throughout the state among rodents, so that even today it is necessary to continuously spend large sums of money in squirrel extermination.

In 1914, plague appeared in New Orleans, with the result that over $8,000,000 were spent in rat extermination and the rat-proofing of buildings.

A recent report of the Public Health Service shows plague in all sections of the world, from India and China through Syria, Greece, Italy, into Liverpool; also in Peru, Chili and Brazil. The epidemic in Tampico and Vera Cruz have been given considerable publicity, and the invasion of the United States has already occurred along the Gulf, plague cases having been found in New Orleans, Galveston and Beaumont.

As all authorities concur in the opinion that no port which does not have rat-proof docks is safe from an incursion of plague, we can view with alarm the rotten old wooden wharves that disgrace our waterfront, unscreened or otherwise protected, some of them over 100 years old and teeming with rats. We must wonder how we have been able so long to have escaped an epidemic. In fact, the waterfront conditions of Boston are most conducive of an invasion of bubonic plague, brought by vessels arriving directly from infected ports and at this very moment no one can truthfully say that there is no rat plague in Boston. It is more than probable that there are already within our limits many rats infected with this disease.

According to the best authorities, every case of human plague in a community costs at least $7,500 and every case of rodent plague at least $5,000. From a purely economic standpoint, rat-proofing is pure saving—and it only adds two per cent. to cost of construction. Should plague invade Boston, enormous losses would result from quarantine and the diversion of commerce beyond even approximate estimation; and yet, here we rest, one of the large Atlantic seaports (although by no means as large as we should be and could be under intelligent business methods) with rotten rat-ridden docks adjacent to a large market district and a disreputable tenement district, and hope that through Providence or good fortune to escape the results of our own apathy.

For such reasons, therefore, diagnosis of plague is a matter of much more than academic interest to the physicians of Boston, for when human infection does occur, the first observed manifestation will be a human case, and for diagnosis dependence must primarily be placed in the general practitioner. How many of them are capable of making such a diagnosis? I ask you, gentlemen, do you really believe ten per cent. of the regular profession are capable, and I make no reference to that vast army of irregulars who are so freely allowed to prey upon the public by our too liberal medical laws?

While it is not within my province, either from education or experience, to play the rôle of pathologist—and I refer you to such eminent authorities as Sir Patrick Manson, the founder of scientific tropical medicine; Dr. W. J. R. Simpson, Dr. Richard P. Strong, Admiral Stitt and the experts of the Public Health Service—it may be well here to give a brief description of the symptoms and some of the measures taken in epidemics, which are derived from the best authorities.

The symptoms are sudden onset, rise of temperature and marked prostration. At onset, frequently appears a mental haziness, disordered motor coördination resembling some stages of alcoholic intoxication (I presume you have not yet entirely forgotten such matters as occurred before January first, last year). A chill is quite common and buboes in the lymphatic glands are the signs. These are largely femoral, inguinal, axillary, and cervical. Nine times out of ten the bubo is in the femoral and usually on one side only, due to the rat flea generally biting the lower portion of the leg, but axillary buboes often occur due to infection of the flea bites on hand or forearm. The bubo appears suddenly, coincidentally with onset of the disease. The skin immediately above is hot and red, and the mass is exceedingly tender and painful to the touch. Unlike venereal swellings, it shows a broad flat surface, seldom coming to a point and does not suppurate until a week or two after the onset, if at all. Pneumonia often follows, through invasion of the respiratory tract, and septicaemia follows direct entry of microbe into blood. The pneumonic form is very infectious through inhalation of dried sputum of victims being blown about, and spreads from man to man without aid of other carriers. Hemorrhages under the skin, making dark purple blotches of stagnant blood, "petechiæ" or "tokens" sometimes occur. This was the origin of the name, "Black Death."

It is only during comparatively recent years that the true cause of plague has been known, even so great an epidemiologist as Hecker himself having attributed it to astral and telluric causes.

The causal agent of the plague, the Bacillus Pestis, was first discovered in the Hongkong epidemic of 1894 on June 14, by Dr. S. Kitasato of Tokyo, chief of the Japanese Commission. About a month later, confirmation was made by Dr. Yersin of the Pasteur Institute discovering independently in the same epidemic the same bacillus. But it was not until 1896 that the Indian Plague Commission discovered the rôle of the rat and his flea, and the progress and extension of the disease through the migration of rats from infected districts.

Zirolia and others have found that the Bacillus Pestis multiplies in the stomach of the flea, retaining its virulence for over 20 days, so that the flea serves not only as the carrier but also as the mutiplier of the germs. When the infected rat dies, the fleas leave the cooling body and seek the nearest available host, communicating the plague bacillus either on its fouled mandibles or by regurgitation of the contents of its stomach during the act of sucking, or by provoking scratching and consequent inoculation by the bacilli deposited by its fæces on the skin. Rat fleas probably remain alive for two weeks after the death of the rat which infected them, and are dangerous during the entire period. The disappearance of plague in cold weather is due to the effect of the temperature upon the flea, as the B. Pestis can withstand freezing, while sunlight and drying are inimical.

Vergbitski claims that the bed-bug may play a part in spreading infection from man to man, as he experimentally transmitted plague from man to rats by infected bed-bugs, and plague bacilli have been found in such vermin taken from the beds of infected people. Some authorities also believe the same is true of the human flea—the pulex irritans.

In all epidemics of whatever nature, vaccination and inoculation immediately occur to mind as prophylactic and therapeutic agents. Haffkine, who had gained celebrity by his anti-cholera vaccinations in India in 1893, was the first to use anti-plague vaccination in Bombay in 1897. He employed old killed broth cultures and reduced the number attacked by the plague to the extent of 77% to 85% and also diminished the mortality of those attacked.

According to Simpson, Haffkin's prophylactic "causes in a few hours a rise in temperature to 102 or sometimes 105 degrees F., headache, nausea, and discomfort, which usually continues for about 48 hours. At the site of inoculation, which is generally in the arm or loin, a painful swelling appears which necessitates rest for a day or two and remains evident for at least a week. Immunity is established in a week's time, but partial immunity much earlier. At no time does it render the inoculated more susceptible to the disease. The protection lasts, it is believed, for about six months." The dose is from 2 cc. to 5 cc. for an adult and .5 cc. to 1 cc. for children. It is injected subcutaneously under strict antiseptic precautions.

After Haffkin, Yersin prepared a serum by the immunization of horses with dead, and later with living cultures. The dose is from 10cc. to 20 cc., also administered hypodermically. Simposn says, "It does not cause nearly the same degree of discomfort or local inflammatory action and produces a more immediate immunizing effect; but, in some persons, it may be followed in a week or fortnight's time by symptoms simulating rheumatism, accompanied by swellings of some of the joints, which is successfully treated by the administration of salicylate of soda. The protective effect is limited to about a fortnight's duration. Owing, however, to the small discomfort which it generally produces, it can be repeated before the expiration of this period."

Simpson believes that neither Haffkine's prophylactic nor Yersin's serum "afford absolute protection against a plague attack, but they do protect in a very high degree, and if the person inoculated is afterwards attacked with plague, the chances of recovery are greater than when not inoculated." In the New Orleans epidemic of 1914 brilliant results were reported of the therapeutic use of Yersin's serum, when used in large doses—200 cc. were given and repeated.

Strong and Kolle have recommended the use of living virulent cultures and Strong has practically shown that this method of vaccination can be carried out without danger. This vaccination consists of the intramuscular injection of one whole twenty-four-hour agar slant of the living virulent culture in an adult. The reaction is not excessive.

But we must recognize the fact that unless in the throes of an epidemic, it is manifestly impossible to enforce Haffkinization or other such prophylaxis in America. When we remember that there is today a large body of ignorant people who oppose smallpox vaccination, despite the fact that its worth has been proven over a century, it is readily understood how inoculation for plague would be regarded. Boston is especially unfortunate in this particular, having a large percentage of these blind fanatics, as well as Medical Freedom Leaguers and anti vivisectionists who, however, never refuse, when ill, to receive the benefits of the investigations they so strongly condemn when well.

G. W. McCoy, director of the Hygienic Laboratory of the Public Health Service, regrets that in plague outbreaks, "popular and professional interest is so frequently centered upon prophylaxis by vaccines or serum, when the situation demands active measures against rodents." He says, "If people want to be vaccinated for prophylactic purposes, there is no objection in complying, but the community should not be allowed to delude itself in the belief that plague may be controlled in this manner. The essential features of an anti-plague campaign should be the extermination of rodents and not the immunization by means of vaccines and serums."

And it is on such authority, gentlemen, that I ask you to use your position as advisers of school children for the extermination of rats—the greatest prophylactic known against the most awful epidemic disease on earth.

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The Eighth Harvey Society Lecture.—The eighth Harvey Society Lecture was delivered at the New York Academy of Medicine on Saturday evening, March 12, by Dr. S. B. Wolbach, Associate Professor of Pathology and Bacteriology, Harvard University. His subject was "Typhus Fever and Rickettsia."

## Original Articles.

### SOME MODIFICATIONS OF TECHNIQUE IN GALL-BLADDER SURGERY.

By G. Forrest Martin, M.D., F.A.C.S., Lowell, Mass.

I presume that my experience differs in no way from that of other operators, in that we develop, step by step, in each operation, a method of working, founded upon a set of convictions concerning the principles involved. The sum total of all this makes up what we may call our "technique." Some men are more original than others; some blindly follow every edict of certain leaders in the surgical field, even though they have to work pretty fast to keep up with the changes of methods which these leaders adopt; then there is a third class having the habit of studying the work of the leaders, both at first hand and in their writings, but at the same time have been grounded in the fundamental information which enables them to understand the underlying principles involved. These men think for themselves; are quick to see the weak or the strong points of some new measure, and in the end do creditable work in their own sphere. So the changes and improvements in technique come about.

Thus we have all seen the contests over hysterectomy between the advocates of the suprapubic *vs.* the vaginal route. We have seen many of our best operators turn "about face" on the question of perineal *vs.* suprapubic prostatectomy. We have followed in like manner the contest between the advocates of cholecystostomy *vs.* cholecystectomy, until today we have the indications for the proper selection between these two operations almost as clearly defined as is appendiceal surgery.

To illustrate the principle that the better the man the more willing is he to change his mind, let me quote a few passages from some of the best of them on this last question.

First let me quote W. J. Mayo under date of April 8, 1911. He wrote, "In early operations it is not necessary to remove the gall-bladder and this valuable organ can be saved." And in September of the same year he wrote, "Cholecystostomy with temporary drainage of the gall-bladder to the surface, is the operation preferred, because it saves this valuable organ for future function."

Two years later Moynihan wrote, "In many cases, in removal of the gall-bladder, we are *doing away with the necessity for drainage*. by removing that structure the drainage of which seemed imperative. During the last eight years I have inclined more and more to the performance of cholecystectomy, and after some hesitation, and some trepidation, which experience removed, I am strongly disposed to advocate the frequent, though certainly not invariable adoption of this operation in preference to cholecystostomy. This in view of the character of the cases which submit themselves to surgical treatment."

At this same period, however, we find the same class of men teaching that cholecystectomy is not so safe an operation as cholecystostomy; that it requires larger incisions and more extensive manipulations; that the raw surface sometimes resulting in the gall-bladder notch of the liver after excision required special measures to stop the oozing of blood, etc., etc.

Now let us step ahead five years and hearken to Charles Mayo as follows: "Since our appreciation of the fact that infection is the prime factor we have revolutionized the surgical treatment of this condition at our clinic. Cholecystectomy in diseased gall-bladders or existing cholecystitis, with or without stones, gives a higher per cent. of cures than cholecystostomy. The figures are: 71% cured, 22 relieved and 7 not, for the former; against 53, 38 and 9 for the latter."

In 1918, in their clinic volume, we find this unhesitating statement: "There can be no question but that cholecystectomy as *as safe a procedure as* cholecystostomy, if the operator has had ordinary experience."

In 1918, we find Judd at the Mayo Clinic, writing as follows: "At the present time, with a larger experience, we are removing gall-bladders which we previously believed should be drained. Removal of the gall-bladder is indicated in all cases of cholecystitis. Gall-bladders containing stones would better come out. They probably do not function normally after drainage and its resulting adhesions, and there is much evidence that the stones re-form and the trouble recurs and operation becomes necessary."

And yet, in 1914, I saw Sir Abuthnot Lane, in his clinic in London, pick up a gall-bladder full of stones, examine it, and then drop it back into the abdominal cavity with the remark that he "would not bother about that." And he then proceeded to remove the entire large intestine for the digestive disorder.

Pathological changes in the gall-bladder walls or enlargement of the regional lymphatics are distinct indications for gall-bladder removal.

Quoting again from the Mayo Clinic: "Thick-walled, functionless gall-bladders are a *cancer menace* and should be removed. Gall stones are found in nearly all of our cases of carcinoma of the gall-bladder, although, as a rule, there had been no recent symptoms. However, a good early history of gall stones was usually obtainable, showing that the stones could have been removed at an earlier period and the carcinoma prevented."

It should also be clearly understood as a well established fact, that chronic cholecystitis without stones does exist as a definite pathological lesion, and produces a train of symptoms that will be relieved by removal of the gall-bladder. We may even find such gall-bladders little changed in appearance in a few cases and yet the regional lymphatics are enlarged and help the diagnosis.

So much for the principles underlying the call for gall-bladder operations.

Let us now discuss the methods of procedure. Let it be said in beginning that operations upon the upper abdomen have always been fraught with greater difficulties than in the lower. Chief among these have been the close apposition of many vital organs in a concentrated area, and the difficulty of keeping the intestines from crowding into the field where we must work. We find various incisions in use for entering the upper abdomen. Chief among these may be mentioned the Mayo-Robson, Kocher, Kerr and Bevan incisions. The two latter have no essential differences,—consisting of a vertical incision with oblique or curved extensions above and below.

Kocher parallels the lower border of the ribs diagonally. The Mayo-Robson incision starts like the Kocher and then drops directly downwards. In years past I have tried them all, rather preferring the Kerr. I have had more or less trouble to get a perfectly satisfactory closure, especially in very fat abdomens where the intra-abdominal pressure is always great. And this is the principal reason why *I am not using this technique now*. I want to impress upon you now, the anatomical fact that, in the triangle below the ribs and sternum the internal fascia, fused with the peritoneum, has fibres which are *directly transverse.* These are cut directly across in all of the above described incisions, and in sewing up, not only do the stitches readily cut out under tension, but undoubtedly this also frequently happens in the first vomiting and retching which so often follow these operations.

It was not until two years ago that I had the courage to abandon this routine method and enter the upper abdomen, especially for gall-bladder work, by an incision directly transverse, and usually about two inches above the navel. At that time it was my good fortune to witness some gall-bladder surgery by Alex. Moschcowitz in New York, and I was much impressed by the beautiful exposure of the needed parts, and the facility with which the work could be accomplished through this transverse incision. It is to his work and to his writings on the subject that I owe much which I shall have to say in regard to this incision. I have used it frequently, both for work upon the gall-bladder and for such operations as gastroenterostomy, pylorectomy, and duodenal ulcers. It is equally good for all of them, and the more I use it, the better I like it! And this remark applies both to the time of operation and to the after results.

While operating, if a firm pillow is placed under the chest, across the back, the wound opens more readily and the intestines drop downwards towards the pelvis. Moynihan, in describing this procedure in his admirable work on abdominal operations, remarks, "The only disadvantage of this position is that, *when a vertical incision is employed,* the edges of the wound are necessarily very tense, owing to the pushing forward of the rib margin and the consequent tightening of the abdominal wall." How often have we found this true! Think of the strength that we have expended on retractors to overcome it! Then, in the very next paragraph he writes: "The best incision is a vertical one, made at first about four or five inches in length through the right rectus, near its outer border." Would not this seem to be a good argument against the vertical incision?

Now, I have demonstrated to my complete conviction, that the intestines require much less manipulation, and much less packing back, when the upper abdomen is thus entered, than is the case with the vertical incision. As the closed abdomen has no vacant space into which the organs can be pushed aside when room is needed, I have given considerable thought to the question of why there should be this difference in the intra-abdominal pressure when it is opened in these two different ways. And I have arrived at an explanation which I do not remember to have seen in print.

All surgeons are familiar with the greatly increased reflex disturbance which is caused by pulling or tugging upon a part as compared with the clean cutting of that same part with the scalpel or scissors, and those who work under local anaesthetics are frequently reminded of this fact. Now, nearly all deep work about the gall-bladder and ducts through a vertical incision, requires forcible distention, laterally, of the abdominal walls, either by manual or self-retaining retractors, for a considerable length of time. I am quite positive that this is a frequent cause of vomiting, and more important still, of resistance, on the part of the patient, thus requiring more anesthetic to keep him quiet. This incision opens so readily over the seat of our work, that this traction is much lessened. Within a week I have removed a large, firmly adherent gall-bladder which actually lay an inch to the right of the outer end of this transverse incision. Comment on this case seems unnecessary; yet we find many just such cases.

There is another quite large class of cases where, to my mind, it is equally valuable. I refer to those cases where we find the pylorus far to the right and adherent to the under surface of the liver or to the gall-bladder. I am quite convinced, from the study of many plates, that, where the x-ray findings show the pylorus well to the right in every plate, we have a good indication for operative interference, even though the findings may be entirely negative in regard to stones or ulcers. The normal stomach, as it empties, drops naturally to the left unless held to the right by adhesions. And these usually result from chronic cholecystitis! I have found these cases much easier to manage since I adopted this technique. If cholecystostomy should be the operation of choice, the drain can drop into any part of this incision and is far more direct than through the vertical openings. When it comes to the time of closing the abdomen the real value of the method becomes apparent. After the removal of the pad from beneath the back the incision literally drops into place and *invites the suture.*

I have said enough to convince you that I am already a very ardent cross-incisionist. Now what are the objections usually raised against it? The chief one is the cutting across of the rectus muscle. I think the answer to that is that the muscle is not the holding part of the abdominal wall. The fascia is far more important from the standpoint of strength and future hernia. Again, the nerves to this part of the rectus enter it almost horizontally, and from the sides.

*All surgical principles are violated* when a long vertical incision cuts off many of these control nerves of the rectus. In the transverse route, not more than one of these is cut, if any, and the muscle is carefully sutured back in place. The muscle repairs firmly and promptly, and I have yet to see one where any depression exists. It should also be remembered, as Deaver explains, that the lineae transversales, of which there are three between the navel and the sternum, limit the injury to a very small portion of the rectus. It has seemed very strange to me to see Judd, for instance, describing a very elaborate scheme of multiple transverse slits through the internal oblique fascia, after enlarging the longitudinal incision in the external oblique, to *avoid cutting across the fibres* of the aponeurosis of the internal oblique, when more room is needed either above or below the original incision. And yet in gall-bladder work in the upper abdomen, the strong combined internal oblique fascia and peritoneum is deliberately cut across in every operation. And in a paper written by the same operator in May, 1911, he says: "Many times we are tempted to remove an adherent appendix through a right rectus incision which was made primarily for a gall-bladder operation. But in so doing, we may be obliged to *sever one or more of the important nerves* which may cause the muscle to atrophy and allow a hernia to develop."

Why does this principle apply to the lower or middle part of the rectus and not to the upper?

I come now to the third and last feature of gall-bladder surgery which I wish to discuss. I refer to drainage. This is another part of the technique in which I have taken a radical "about face."

Many of you have doubtless read a recent communication from Dr. Bottomley reporting, I believe, twenty-three cases of chlecystectomy recently operated, in which he has closed the abdomen without drainage. Why not? I have, since reading that report, closed ten similar cases. Previous to this, my usual technique had been, for years, to attach a cigarette drain to the region of the cystic duct stump by a very fine plain c.g. suture to keep the deep end in place. This suture would soften and give away in four or five days, when the drain was usually removed. If the manipulations had been extensive, larger drainage was provided. In the meantime, there was usually more or less of a discharge of bile on the dressings which I have considered an excuse for the drain. Moschcowitz, whose work I have so much enjoyed, writes, on this question of drainage, as follows:

"It is conceded in general, that a most important factor in the production or prevention of post-operative hernia is the amount and the duration of the drainage. In this connection, I would therefore call attention to the fact that for a number of years it has been my custom to drain all cholecystectomies by a rather good-sized drainage tube, which is surrounded by strips of gauze so that the final drain has a diameter of nearly an inch. It is my custom to remove the gauze on the fourth or fifth day while the tube drain is shortened gradually, and is not removed until the tenth or twelfth day. In spite of this I have not seen a single hernia."

Now, I am willing to accept this as a strong argument for the transverse incision; but I am going to depart from his teachings in regard to the question of drainage. The more I have thought about the "drainage" question the more convinced have I become that the bile which the drain brings out comes entirely from the liver surface, and not from the cystic duct stump. If so, it is probably sterile in the great majority of cases, as it has never entered the ducts where it can be so readily contaminated by colon bacillus. I make this statement with full cognizance of the fact that Rosenow and others have been able to demonstrate that the blood stream is frequently the carrier of the infection to the walls of the gall-bladder and the ducts, for we are not going to close up our cholecystectomy cases in the presence of gross pus infection. And so I am trying out the closing up of all but these gross lesions without drainage, in the full belief that the peritoneum is able to care for a few germs from the bile stream which is itself an antiseptic. It does this with our appendix stumps, so why not with our cystic ducts? To make this study more valuable, I have of late been taking a culture from the stump of the cystic duct before the cautery is applied to it. These cultures are showing colon bacilli and streptococci, so that we are able to say that the germs are there, and yet that the peritoneum is taking care of them very well. As further evidence of this fact I am able to add that the patients are making good recoveries with no more of the post-operative complications than was the average under the old method. I intend, from now on, to take cultures from the raw under surface of the liver also, to see if the small amount of bile that leaks from this surface is also sterile.

I do not need to remind you of the added comfort to the patient with the closed wounds as compared with the dressings of the drainage cases.

In conclusion, let me summarize the matter as follows:

Cholecystectomy is the operation of choice in all but a very limited field, such as elderly patients who must have prompt relief with a minimum shock; gross septic conditions which can be more safely handled by preliminary drainage, with complete operation later, and the like. The field of operation is better exposed, the bowels are kept out of the way more easily, the patient is quieter because less disturbed by manipulations with the transverse than is the case with any other operative method. Vomiting, straining, and other post-operative efforts tend to pull our incision tighter instead of apart, and thus our final wound is stronger. Closure of our wound without drainage bids fair to be an accepted procedure in a great majority of our cases. Experiments show that this is a safe procedure even in the face of positive germ cultures.

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# THE ENERGY REQUIREMENTS OF GIRLS FROM 12 TO 17 YEARS OF AGE.

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[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

*(Concluded from page 306.)*

## TOTAL CALORIES PER 24 HOURS PREDICTED FROM AGE AND WEIGHT.

We have already seen that the total 24-hour basal metabolism is, with all of these nine groups of girls, essentially the same, being represented by a round figure of 1250 calories, and we have stated that this value may properly be used for a general approximation. A careful inspection of the group data, particularly when plotted, shows that there is, however, a slight tendency for the total basal metabolism to increase with increasing weight, although, owing to the fact that there is a specifically high metabolism per kilogram of body weight with the younger and lighter weight girls, this tendency is not very pronounced. By plotting the data in Table X for the total calories per 24 hours referred to weight and drawing through the plotted points a line indicating the general trend of the metabolism, we are able to predict the most probable 24-hour basal heat production for girls weighing from 38 to 58 kilograms. These predicted values are given in Table XI herewith. From an inspection of this table, one is immediately struck by the fact that a group of girls with an average weight of 38 kilograms has a total 24-hour basal metabolism but 66 calories lower than a group weighing 58 kilograms. Thus, while the average value of 1250 calories is probably as close an estimate of basal needs as one is justified in making for girls of this age range, a slightly greater degree of refinement, on the basis of weight, is shown in the values given in Table XI. While there is only a very small difference in the total heat with a change in weight from 38 to 58 kilograms, Table XI is presented primarily as an extension of an earlier table giving the basal heat production of boys and girls per 24 hours predicted from body weight.[21] It is important here to note that when the total calories compared to age are charted and a line is drawn through the plots to indicate the most probable metabolic trend, this line is so nearly horizontal as to give an

Table XI.—Basal Heat Production per 24 Hours Predicted from Body Weight, for Girls Weighing from 38 to 58 Kilograms.

| Weight (without clothing) | Predicted heat per 24 hrs. | Weight (without clothing) | Predicted heat per 24 hrs. |
|---|---|---|---|
| kgs. | cals. | kgs. | cals. |
| 38 | 1218 | 49 | 1254 |
| 39 | 1220 | 50 | 1257 |
| 40 | 1225 | 51 | 1260 |
| 41 | 1228 | 52 | 1264 |
| 42 | 1230 | 53 | 1266 |
| 43 | 1234 | 54 | 1270 |
| 44 | 1238 | 55 | 1274 |
| 45 | 1240 | 56 | 1276 |
| 43 | 1244 | 57 | 1260 |
| 47 | 1248 | 58 | 1284 |
| 48 | 1250 | | |

extreme range only of from 1256 calories with the 17-year-old group to 1245 calories with the 12 years, 2 months old group. Consequently, we are not justified in assuming any other than an average basal value of 1250 calories, when predicting the total 24-hour basal heat production from *age*.

### PREDICTION OF THE BASAL HEAT PRODUCTION PER UNIT OF WEIGHT AND PER UNIT OF SURFACE AREA.

In the attempt to correct for the influence of the considerable differences in weight among individuals we may properly predict the basal metabolism on the basis of the heat computed per unit of body weight and, with certain reservations, per unit of surface area, referred both to age and to weight. A comparison of these four methods of predicting the basal heat production is of value from two points of view: first, the comparison enables us to determine which is the most accurate method *per se*, that is, the method involving the least error in prediction; second, it affords an opportunity for studying the relative accuracy of prediction from body weight and from body surface area, a question that is of great physiological interest. Consequently, we will treat all of these methods of prediction at the same time.

We have already noted in Table XI the important relationships between the heat per kilogram of body weight and both age and weight, and also the relationships between the heat per square meter of body surface area and age and weight. From the plotted points in Figures 2 to 5 and from the lines thereon representing the most probable in Table XII. For example, in predicting the metabolic trends we have derived the data given heat per kilogram of body weight from age, we refer to Figure 2 and find that at the age of 17 years the actual heat per kilogram is 21.7 calories, while the predicted heat, read at the point where the line representing the general trend passes the 17-year ordinate, is 21.2 calories. Thus the predicted heat is 0.5 calorie less than the actual, or the prediction is made with an error of —2.3 per cent.

An examination of the percentage errors involved when predicting the heat per kilogram

Table XII.—Comparison of the Actual Basal Heat Production of Girls per Kilogram and per Square Meter per 24 Hours with that Predicted (a) from Age and (b) from Weight.

| (a) Average age | (b) Average weight (without clothing) | Heat per kilo. per 24 hours<br>(c) Actual | (d) Predicted from age | (e) Predicted less actual (d-c) | (f) Percentage deviation $\left(\frac{e \times 100}{c}\right)$ | (g) Predicted from weight | (h) Predicted less actual (g-c) | (i) Percentage deviation $\left(\frac{h \times 100}{c}\right)$ |
|---|---|---|---|---|---|---|---|---|
| yrs. mos. | kgs. | cals. | cals. | cals. | | cals. | cals. | |
| 17 0 | 58.1 | 21.7 | 21.2 | - 0.5 | - 2.3 | 21.8 | + 0.1 | + 0.5 |
| 15 10 | 53.6 | 21.8 | 23.1 | + 1.3 | + 6.0 | 23.9 | + 2.1 | + 9.6 |
| 14 10 | 49.9 | 25.1 | 25.1 | ± 0.0 | ± 0.0 | 25.6 | + 0.5 | + 2.0 |
| 14 1 | 44.2 | 28.6 | 26.5 | - 2.1 | - 7.3 | 28.2 | - 0.4 | - 1.4 |
| 14 0 | 51.7 | 25.7 | 26.7 | + 1.0 | + 3.9 | 24.8 | - 0.9 | - 3.5 |
| 13 8 | 50.0 | 27.6 | 27.5 | - 0.1 | - 0.4 | 25.5 | - 2.1 | - 7.6 |
| 13 4 | 43.7 | 27.2 | 28.1 | + 0.9 | + 3.3 | 28.4 | + 1.2 | + 4.4 |
| 12 10 | 41.0 | 29.9 | 29.2 | - 0.7 | - 2.3 | 29.7 | - 0.2 | - 0.7 |
| 12 2 | 39.5 | 29.9 | 30.5 | + 0.6 | + 2.0 | 30.3 | + 0.4 | + 1.3 |
| Average | ---- | ---- | ---- | ---- | ± 3.1 | ---- | ---- | ± 3.4 |

| Heat per sq. m. per 24 hours<br>(j) Actual | (k) Predicted from age | (l) Predicted less actual (k-j) | (m) Percentage deviation $\left(\frac{l \times 100}{j}\right)$ | (n) Predicted from weight | (o) Predicted less actual (n-j) | (p) Percentage deviation $\left(\frac{o \times 100}{j}\right)$ |
|---|---|---|---|---|---|---|
| cals. | cals. | cals. | | cals. | cals. | |
| 777 | 745 | - 32 | - 4.1 | 760 | - 17 | - 2.2 |
| 745 | 793 | + 48 | + 6.4 | 808 | + 63 | + 8.5 |
| 830 | 835 | + 5 | + 0.6 | 858 | + 28 | + 3.4 |
| 911 | 866 | - 45 | - 4.9 | 914 | + 3 | + 0.3 |
| 876 | 869 | - 7 | - 0.8 | 833 | - 43 | - 4.9 |
| 928 | 884 | - 44 | - 4.7 | 857 | - 71 | - 7.7 |
| 867 | 898 | + 31 | + 3.6 | 916 | + 49 | + 5.7 |
| 922 | 920 | - 2 | - 0.2 | 923 | + 1 | + 0.1 |
| 916 | 946 | + 31 | + 3.4 | 924 | + 9 | + 1.0 |
| --- | --- | -- | ± 3.2 | --- | -- | ± 3.8 |

referred to age (see column f, Table XII) shows that there are two instances where the error is 6 per cent. or more, but on the average the error is ±3.1 per cent. Thus it is possible to predict from the curve in Figure 2 the heat production per kilogram of body weight of groups of girls from 12 to 17 years to within a plus or minus error of 3.1 per cent. At this point attention should be called to the earlier predictions from general trend lines made by this Laboratory. Thus, in the prediction of the metabolism of young boys from 1 to 13 years of age it was found that on the basis of weight the total basal heat production could be predicted for boys above 10 kgs. to within an error of ±6.3 per cent., and for girls above 10 kgs. to within a somewhat greater error of ±7.5 per cent.[22] Computations of the predicted heat for boys and girls on the basis of the calories per kilogram of body weight referred to weight, showed no smaller average error, and consequently were not reported in detail. With the Girl Scouts, computations have shown that the prediction of the total heat from either weight or age is not as accurate as when the prediction is made per unit of weight and per unit of surface area. Under these conditions, as seen in Table XII, the error of prediction is not far from ±3.1 to ±3.8 per cent. At first sight, therefore, it would appear as if the prediction for girls between 12 and 17 years of age was of a very much higher order of accuracy than that for boys or for girls of younger ages. It is necessary, however, to bear in mind continually that we are dealing here with the prediction of the values for *groups* of girls, in which individual variations have in large part been wiped out, and consequently a direct comparison is not to be uncritically applied between the error of ±3.1 per cent. in the prediction of the heat production per kilogram per 24 hours from age for groups of girls 12 to 17 years old, and the error of ±6.3 per cent. and ±7.5 per cent. in the prediction for individual boys and girls, respectively, 1 to 13 years of age.

Of the four methods of prediction shown in Table XII, that is, the calories per kilogram of body weight predicted from age and from weight, and the calories per square meter of body surface predicted from age as well as weight, two are perceptibly better than the other two. That is, both predictions from age are made with a greater degree of accuracy than the predictions from weight, the error of prediction being ±3.1 per cent. in the case of the heat per unit of weight and ±3.2 in the case of the heat per square meter of body surface, as against ±3.4 and ±3.8 per cent., respectively, when the predictions are made from weight. But what is of most significance physiologically is the fact that when we compare the prediction per unit of weight with that per unit of surface on the age and the weight basis, respectively, we find that the prediction is somewhat better for the heat per kilogram of body weight than for the heat per square meter of body surface. As a matter of fact, the difference in the error of prediction between the heat per kilogram predicted from age and the heat per square meter predicted from age is almost insignificant, although the error is actually smaller in the former case. When the prediction is made from weight, the heat per kilogram may be predicted with measurably greater accuracy than the heat per square meter. It thus appears that with these groups of girls, at least, the heat production is somewhat more closely related to the weight than to the surface area, a finding quite in agreement with that noted with younger children of both sexes.[23]

Finally, it can be seen that for practical purposes there is a slight advantage in predicting the heat production of girls on the basis of the heat per kilogram of body weight when referred to age. Consequently we present in Table XIII values for the most probable basal heat production per kilogram of body weight per 24 hours for girls from 12 to 17 years of age, the values representing each half year.

Table XIII.—Basal Heat Production per Kilogram per 24 Hours Predicted from Age, for Girls from 12 to 17 Years of Age.

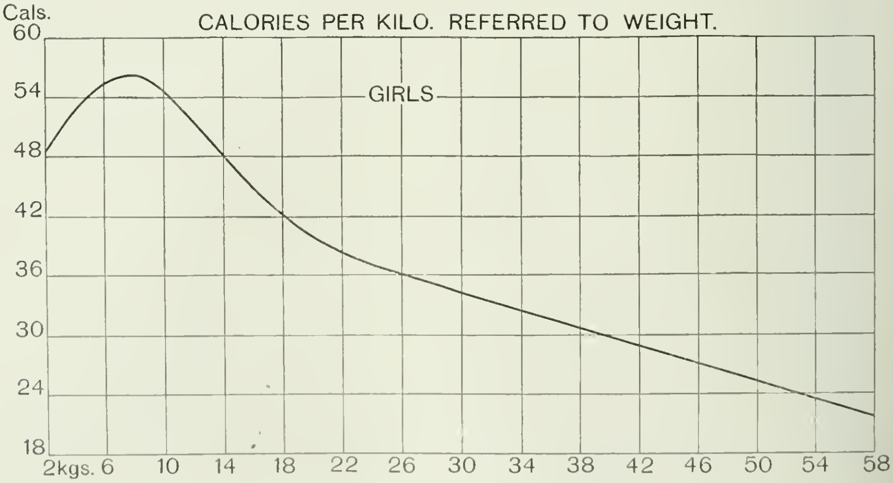
| Age | Predicted heat per kilo. per 24 hours |
|---|---|
| yrs. | cals. |
| 12 | 30.9 |
| 12½ | 29.9 |
| 13 | 28.8 |
| 13½ | 27.7 |
| 14 | 26.7 |
| 14½ | 25.7 |
| 15 | 24.6 |
| 15½ | 23.6 |
| 16 | 22.6 |
| 16½ | 21.7 |
| 17 | 21.2 |

Heretofore the best, if not, indeed, the only, present-day standard used by clinicians for girls of this age-range is that offered by Aub and Du Bois,[24] who give the calories per square meter of body surface per hour for girls from 14 to 16 years of age as 43.0. This is the lowest age range for which they propose a standard, and it is of interest to compare this suggested standard with our actually determined facts. We studied two groups of girls averaging 14 years of age, who showed a heat production of 37.3 calories per square meter of body surface per hour. We likewise studied one group averaging 15 years, and one 16 years, having a heat production of 34.6 and 31.0 calories per square meter per hour, respectively. It can be seen, therefore, that the Aub and Du Bois standard is, on the basis of our determined values, 15.3 per cent. above the actually measured metabolism of the 14-year-old groups, 24.3 per cent. above that of the 15-year-old group, and 38.7 per cent. above that of the 16-year-old group. If we throw the data for all of our groups between 14 and 16 years together and get an average value, *i.e.*, 34.3 calories, the Aub and Du Bois standard is 25.4 per cent. above this. It is clear that however helpful the standards for males as presented by Aub and Du Bois may be, their standard for girls from 14 to 16 years of age should be very considerably revised.*

### GENERAL TREND OF METABOLISM OF GIRLS FROM BIRTH TO SEVENTEEN YEARS OF AGE.

Throughout the study of the Girl Scouts and the younger children, reported elsewhere,[25] it is seen that changes in weight, age, and stature are all very closely correlated with basal metabolism. After the child reaches maturity, weight changes are very gross and the influence of age, though present, is slight. It is, therefore, impracticable to attempt any curve representation of the trend of metabolism from birth to old age, on the basis of weight or surface area. For the period from birth until 17 years of age such a comparison is, however, justifiable, and we give in Figure 6 the curve representing the calories per kilogram of body weight per 24 hours referred to weight for girls 17 years of age and under. From 2 to 26 kilograms the curve is identical with that recently published by Benedict and Talbot, based upon the study of a large number of normal girls.[26] From 38 to 58 kilograms the curve is identical with that in Figure 3 of this report and represents the measurements made upon the Girl Scouts. Between 26 and 38 kilograms the curve has been more or less arbitrarily smoothed, although it should be stated that the two curves, that of Benedict and Talbot and the straight line obtained from the measurements of the Girl Scouts, unite almost perfectly. It is clear that there is a specifically high metabolism per kilo-

FIG. 6.—BASAL HEAT PRODUCTION PER KILOGRAM PER 24 HOURS REFERRED TO WEIGHT, OF GIRLS 17 YEARS OF AGE AND UNDER.



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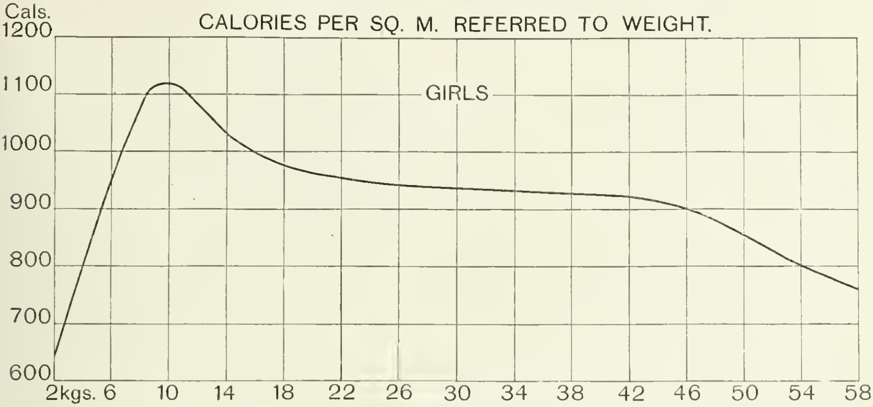
* While our subjects were asleep, the difference in standards can in no sense be wholly explained by this fact.

Fig. 7.—Basal Heat Production per Square Meter of Body Surface per 24 Hours Referred to Weight, of Girls 17 Years of Age and Under.



gram of body weight with girls of about seven kilograms, and that this gradually falls off as the weight increases, rapidly at first, but after 26 kilograms in essentially a straight line.

The trend of the calories per square meter of body surface area referred to weight is given both for the younger girls of Benedict and Talbot and for the Girl Scouts in the somewhat complex curve in Figure 7. Here up to 32 kilograms the curve is identical with that of Benedict and Talbot[27] and from 38 kilograms on is that derived from the Girl Scout material. It can readily be seen that a straight line smooths the curve between the weights of 32 and 38 kilograms perfectly. It is clear that there is a distinct tendency for the metabolism per square meter of body surface to remain at a very regular rate from 22 to about 44 kilograms. Thereafter there is a somewhat more rapid decline in the rate of heat production. It is impracticable to carry this curve into the adult stage, for with adults, weight, stature and age are very diverse. This curve flatly denies the legality of the general contention that the heat production is constant per square meter of body surface. Certainly with girls from birth to 17 years of age the heat production per square meter of body surface is a very variable factor.

### INFLUENCE OF THE PREPUBESCENT STAGE UPON METABOLISM.

In Figure 6 the regularity of the curve for the heat production per kilogram of body weight for weights from 26 to 58 kilograms gives no suggestion as to the possibility of a particular influence of the prepubescent stage, which would correspond, roughly speaking, to weights of 40 to 50 kilograms. In Figure 7, however, where the calories per square meter of body surface are represented, there is a hint of a distinct decrease in the metabolism per square meter of body surface immediately following the prepubescent stage, this decrease pursuing a fairly regular course as far as the girls were studied. However, by reference to the earlier charts in figures 2 to 5 it can be seen that the distribution of the individual points indicating those girls who had or who had not reached puberty gives very little ground for assuming any special influence of puberty or the prepubertal age upon the metabolism of groups of girls.

### SUMMARY.

1. The average, minimum, resting pulse rate per minute of girls from 12 to 17 years of age, just before rising in the morning, was found to be 81 at 12 years, 77 at 13 years, 77 at 14 years, 83 at 15 years, 71 at 16 years, and 74 at 17 years.

2. The insensible perspiration for these girls per kilogram of body weight per hour was as follows: 0.72 gram at 13 years, 0.71 gram at 14 years, and 0.77 gram at 15 years.

3. The respiratory quotients of groups of 12 girls each, about 7 to 8 hours after a light meal, were 0.81, 0.81, 0.78, and 0.79.

4. The calorie requirement of young girls during 10 hours of "bed rest" was on the average 55.0 calories per individual per hour.

5. The average 24-hour basal heat production of groups of girls from 12 to 17 years of age was 1250 calories per individual, irrespective of age.

6. The heat production per kilogram of body weight per 24 hours decreases regularly with increasing age from 29.9 calories at 12 years, 2 months, to 21.7 calories at 17 years. The curve indicating the general metabolic trend is throughout its entire length materially below the few scattered observations of earlier writers.

7. The heat production per square meter of body surface per 24 hours likewise decreases, but not so regularly, with increasing age, ranging from 928 calories at 14 years to 745 calories at 16 years.

8. The metabolism of groups of young girls can be predicted from the general curve indicating the heat production per kilogram of body weight referred to age to within an average error of ±3.1 per cent. The prediction for the heat production per unit of body weight is somewhat better than that per unit of surface area.

9. The curves representing the heat production per kilogram of body weight referred to weight and per square meter of body surface referred to weight for these groups of girls from 12 to 17 years of age blend with remarkable uniformity with similar curves based upon the measurement of a large number of normal girls from birth to 12 years of age.

10. No influence of puberty or the prepubescent stage is clearly proven in any of the results.

REFERENCES.

[1] Benedict, Emmes, Roth, and Smith: Jour. Biol. Chem., 1914, Vol. xviii, p. 139.

[2] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921; Benedict: Boston Medical and Surgical Journal, 1919, Vol. clxxxi, p. 107.

[3] Harris and Benedict: Carnegie Inst. Wash. Pub. No. 279, 1919, p. 227; Harris and Benedict: Proc. Nat. Acad. Sci., 1918, Vol. iv, p. 370; Harris and Benedict: Sci. Mo., 1919, Vol. viii, p. 385.

[4] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, fig. 50, p. 181; Benedict: Boston Medical and Surgical Journal, 1919, Vol. clxxxi, fig. 28, p. 136.

[5] Andral and Gavarret: Ann. d. Chim. et d. Phys., 1843, sér. 3, Vol. viii, p. 129.

[6] Magnus-Levy and Falk: Archiv. f. Anat. u. Physiol., 1899, Suppbd., p. 314.

[7] Du Bois and Du Bois: Arch. Intern. Med., .916, Vol. xvii, p. 863; Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, pp. 61 and 62.

[8] Harris and Benedict: Carnegie Inst. Wash. Pub. No. 279, 1919.

[9] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 233, 1915, p. 06, and No. 302, 1921, p. 145 *et seq.*

[10] Du Bois: Arch. Intern. Med., 1916, Vol. xvii, p. 887; Olmstead, Barr and Du Bois: Orch. Intern. Med., 1918, Vol. xxi, p. 621.

[11] Harris and Benedict: Carnegie Inst. Wash. Pub. No. 279, 1919, p. 126.

[12] Benedict, Miles, Roth, and Smith: Carnegie Inst. Wash. Pub. No. 280, 1919.

[13] Benedict and Johnson: Proc. Am. Philos. Soc., 1919, Vol. lviii, p. 89.

[14] Benedict: Carnegie Inst. Wash. Pub. No. 166, 1912, p. 75.

[15] Benedict, Miles, Roth, and Smith: Carnegie Inst. Wash. Pub. No. 280, 1919, p. 134 *et seq.*

[16] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 47.

[17] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 75.

[18] Katzenberger: Zeitschr. f. Kinderheilk., 1913, Vol. ix, p. 167.

[19] Camerer: Zeitschr. f. Biol., 1882, Vol. xviii, p. 220; Camerer: Zeitschr. f. Biol., 1884, Vol. xx, p. 566; Camerer: Zeitschr. f. Biol., 1888, Vol. xxiv, p. 141.

[20] Benedict and Higgins: Am. Jour. Physiol., 1912, Vol. xxx, p. 217.

[21] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 206, table 36.

[22] Benedict: Proc. Nat. Acad. Sci., 1920, Vol. vi, p. 7; Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 194, table 33, and p. 202, table 35.

[23] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921,

[24] Aub and Du Bois: Arch. Intern. Med., 1917, Vol. xix, p. 831, pp. 196 and 203.

[25] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 128 *et seq.*

[26] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 155, fig. 36.

[27] Benedict and Talbot: Carnegie Inst. Wash. Pub. No. 302, 1921, p. 169, fig. 43.

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# BORNHARDT'S FORMULA.

By H. Gray, M.D., Boston, and F. B. Allen, M.D., North Wales, Pa.

### INTRODUCTION.

Bouchard said in 1897: "For a long time to come, good and serviceable medicine will be practised without geometric determinations; but there is a part of medicine in which they are indispensable. . . . the diseases of nutrition." This field of pathology and the related study of normal weight have received a large amount of attention, as witnessed by the several standards of normal weight in the literature. Each has been used, more or less widely, according to the convenience of the form in which it was presented, the reputation of its author, or the positiveness with which it was claimed to be correct. But despite the great value of standards for determining normal weight to nearly every physician, the original claims have been tested but seldom by other than the original observers and reports of these tests showing the degree of accuracy of prediction obtained are rare. This accuracy is, however, easily quantitated, by figuring the deviation (error) of the calculated (predicted) weight from the actual (observed) weight, then converting this deviation in kilograms (or pounds) into an error expressed as a percentage of the actual weight, and finally averaging these per cent. errors for each method of prediction.

### BORNHARDT'S FORMULA.

*Accuracy in Relation to Formula.* This has been demonstrated in previous papers by applying six of these standards (Bornhardt's, U. S. Army and Navy, Medico-Actuarial, Guthrie's, Broca's, and von Noorden's) to two groups of healthy native American men totaling 249, and to Bornhardt's original series of 56. The percentage errors indicated that the most accurate was Bornhardt's rule, for its prediction error averaged 6.0% as contrasted with 8.3% for the next best and 23% for the worst.

*Accuracy of Bornhardt's Formula in Relation to Age, Height, Chest-girth and Weight.* From work reported by Mayall and myself, it is apparent that the prediction error:

1. Is not affected by age within the age-groups observed, *i.e.*, roughly 20-30; but some later studies (unreported) indicate unreliability in children weighing less than 55 kg. (110 lbs.).
2. It is not affected by height.
3. Is not affected by chest-girth.
4. Is affected by weight. When the subject is unusually heavy or light, *i.e.*, in this series less than 128 pounds, or more than 171, the error in prediction was notably larger. By inference from this, either these individuals were abnormal though not so recognized, or for such extremes a different formula is necessary.

*Different Conceptions of the Normal.* Bornhardt, in 1886, thought different standards advisable for judging persons of builds which to the eye seemed weaker or stronger than the average, and similar views have been discussed by others since, *e.g.*, Stratz 1914, Schlesinger 1917, Wood 1920.

In this connection it is pertinent to consider that while the usual "normal" is a mean, or better a mode, the mode is only a "dominant" (Lange 1903), between a high line above and a low normal below (Pfaundler 1916), thus bounding "standard lives" (Medico-Actuarial Committee 1912) in a "normal zone" (Holt 1918). From a theoretical standpoint the intensive mathematical studies by Pfaundler's pupils, Chose and Dikanski, 1914, and by himself in 1916, on the variation distribution, have commanded great interest in Germany, while from a practical point of view, at present, more value may be attached to the judgment of the Medico-Actuarial Insurance Committee, 1912, and Holt, 1918, that the limits of healthy normal variation should be taken as 10% from the mean, or of Emerson as 7%.

*Review of Literature on Bornhardt's Formula.* Bornhardt's first paper in 1886 dealt with the "body weight of drafted men as a means of determining fitness for military service." He quoted, as a straw man so to speak, the view of Quetelet, 1835, and Hammond, that the body weight of the healthy grown man bears a relation to his body length.

In passing it might be added that this view has been a vain inspiration to many others. A height-weight index (H/W), or a weight-height index (centimeter-weight, W/H), or an age-height-weight law, may be seen in the work of Broca (date ?), Von Noorden (date ?), Shepherd 1899, Bouchard 1900, Medico-Actuarial Committee 1912, Gaertner 1913, von Pirquet 1913, Matusiewicz 1914, Stratz 1914, Guthrie 1916, U. S. Army 1916, Pfaundler 1916, Whyte 1918, Dufestel 1920, Bardeen 1920.

Bornhardt, however, "was led by the fact that with increase of the chest girth, also the girth of the other parts of the body increases and that the product of the two measures given (height x chest) is the approximate expression of the body surface." On comparison of this approximate body surface with the body weight of eighteen artillery recruits, he noticed a definite relation between them. In people of *average* robustness and health they were as 1 : 5. "On substitution for Russian pounds and werschok, of grams and centimeters, the figures would naturally be different, but the results analogous." However, he further concluded that "with smaller height the weight may be greater, as in robust men; that the weight does not vary proportionately to the body surface, and that with the same surface the weight may be varied. Hence followed the conservative claim that "the body weight cannot be reckoned *a priori* from height and chest girth. These measurements, however, together with the actual weight, give us valuable data, whose relationship is a clear expression of the . . . . individual's fitness for military service."

In his second paper, with the same title as Paper I, a larger field of usefulness was claimed, and justly: "This gives us the possibility . . . . of calculating the body weight. If we call the height H, the chest girth C and the weight P, then the above relation is expressed for Russian units of measurement, by the equation:

$$HC = 5P \text{ or } P = HC/5 \ (i.e.\ P = HC \times 0.20)$$

"The carrying out of the above calculations during recruiting is too time-consuming. It is desirable to reckon in advance a table for the weights of men of varying statures and chest girths. This I have reckoned for men of *average* constitution all the way from 2 Arschin, 3 Werschok through 2 Arschin, 9 Werschok in height, and from 17 through 24 Werschok in girth at nipple level . . . . arranged *gradatim* according to rising height and chest measurements.''

In Paper III on ''The Numerical Definition of Bodily Constitution,'' he tabulated measurements and weights of 38 more recruits, and also discussed the tests of his method by Alexejewski and Abkowitsch: ''The original Russian measures of weight and distance they transformed into centimeters and grams. . . . . Dr. Alexejewski, who made 79 measurings and weighings, and Dr. Abkowitsch, who weighed and measured 667 recruits, likewise came to the conclusion that a constant relation, varying only within very narrow limits, exists between height and chest girth on one side and weight on the other.''

After these two Russians no further trials of Bornhardt's method seem to have been reported until thirty years later, when it was tested by the present writer on twenty American students and later on a larger group of 229 soldiers. True, the formula had been quoted, but without discussion, by Fröhlich 1895, Vierordt 1906, Baer 1912, Gaertner 1913, Barker 1916, and Vedder 1918. It was their translation of it which we have used throughout:

W (in kg.) = H (in cm.) × C (in cm.) ÷ 240

It was, however, more convenient, in order to record to the nearest integer without bothering with fractions (common or decimal), to transform kilograms into the smaller unit of pounds, thus yielding the hybrid formula:

W (in lbs. avoirdupois) = H (in cm.) × C (in cm.) ÷ 109

or, as multiplication is easier than division:

W (in lbs. avdp.) = H (in cm.) x C (in cm.) x 917

When testing Bornhardt's formula against his own reported observations conversion equivalents were used as shown in Table I.

Table I.

*Linear Constants of Measure*

1 arschin = 16 werschok = 71.120 cm. = 21.0000 inches
1 werschok = 4.445 cm. = 1.7500 inches
1.000 cm. = 0.3937 inches
2.540 cm. = 1.0000 inch

*Weight Constants of Mass*

1 Russian Funt (pound) = 0.4082 k. = 0.90 lbs. avdp.
1.0000 k. = 2.20 lbs. avdp.
0.4536 k. = 1.00 lb. avdp.

*Possibilities of Improving Bornhardt's Standard.* An improvement on Bornhardt's rule presumably might be made by utilizing more measurements of each subject, but any increase of the measurements beyond two would obviously make impracticable the expression of the results in a two-entry table, and so would oblige the worker to do his own calculating, a labor that would prevent the formula from coming into general use. Modification is possible, however, without encountering the difficulty just named, by taking no more measurements, but by altering the constant or by using a root or power of the height, or a similar function of the chest-girth, or a combination of these variations. This would make the formula no more difficult to use, but might reduce the prediction error (the main desideratum), and might incidentally produce an easier factor than 240, the constant in the usual metric translation of Bornhardt's Russian unit formula.

The cube of the height was experimented with by Buffon 1828, Livi 1886 and 1889, and Von Pirquet 1913, in vain according to Meeh 1879, Oeder 1915, and Von Pirquet 1917. The square of the height also has some theoretical reasons in its favor, and was experimented with by Quetelet 1871.

This is even more true of the square of the chest girth, because this power corresponds roughly to the area of a cross section of the chest at the nipple level where the perimeter is customarily measured. This statement is based upon the fact that the area of a circle = Pi $R^2$, or (since the circumference of a circle = 2Pi R and therefore R = C/2Pi), the area = Pi $(C/2Pi)^2$ = Pi $C^2/4Pi^2$ = $C^2/12.57$.

Then the body volume, if considered irregularly analogous to that of a cylinder, would be H x $C^2$ x sp. gr. of the body ÷ 12.57. In practice the latter two numerical constants could be consolidated with any other necessary constant factor like that of Bornhardt's. One might expect accordingly that the height times the square of the chest girth (H x $C^2$) would express the *volume* of the body as accurately as the height times the chest girth (HC) of Bornhardt expresses the *surface* of the body. One would certainly expect that some expression of volume would give a more precise formula, because of the law of physics that weight varies as volume and not as surface, as pointed out in this connection by Moleschott 1879 and Meeh 1879. A further reason for squaring the chest circumference might be deduced (1) from the observation of Allaîre in 1863, after studying 730 French recruits, that weight is modified less by stature than by the circumference of the thorax; and (2) the independent note of Dreyer in 1920 that the weights calculated from chest measurements show greater individual variations than those from trunk lengths.

The use of roots makes a formula excessively inconvenient for practical use. Squares are bad enough.

### EXPERIMENTAL EFFORTS TO IMPROVE BORNHARDT'S RULE.

In the attempt to gain evidence along the lines of the above speculations we have tried a variety of formulae constructed by changing the constant and using squares.

This has been done for the most part empirically, trying various combinations that suggested themselves. In the case of the constant factor a guide has been obtained by substituting in the formula the actual weight of each case in a group, solving the formulae and averaging the factors to get the "constant." For example, using the formula: Weight (in pounds avoirdupois) equals H (in cm) x C (in cm.) x Factor, we got from the series of 229 soldiers the factor 909, and from this series combined with Bornhardt's 56, *i.e.*, a total of 305 cases, the factor 915. It also seemed interesting to see whether a different factor would be obtained by excluding those solutions of the formulae on the men who gave extremely high or low factors (owing to peculiarities of height or chest girth); on omitting therefore arbitrarily the 15 highest factors and the 15 lowest factors, a total of 30, or about 10% of the total, the remaining central and presumably more normal factors gave the average of 901 in the series of American soldiers mentioned, and 912 for the central factors derived from the consolidated group of 305 men.

The various experimental formulae were then applied to the recorded measurements and weights, and the percentage of error in predicting weight was calculated by the methods detailed in our previous papers. For the sake of simplicity only the average error without regard to sign, that is, the arithmetic mean, was considered; and no attempt was made to estimate the algebraic mean, the standard deviation, or the coefficient of variation. The resulting averages in Table II show that the least error, 5.6%, pertains to the formula:

W (in lbs.) = 91 x H (in cm.) x C (in cm.),
*i.e.* W (in kg.) = 414 x H (in cm.) x C (in cm.),
*i.e.* W (in lbs.) = 587 x H (in inches) x C (in inches)

Presumably the slight superiority over Bornhardt's of the factor here proposed is due to the larger series on which it was based.* In the same way the factor proposed can probably be excelled by anybody who will make similar calculations on a larger series.

The range of his series, of mine, and of Dreyer's† may be of interest and is given in Table III.

TABLE III.

| | Bornhardt's 56 | Gray's 249 | Dreyer's No. ? in Book | Dreyer's 16 in Lancet |
|---|---|---|---|---|
| Age | 21–25 yrs. | 18–34 yrs. | | 13–52 yrs. |
| Height | 165–182 cm. | 147–193 cm. | | 140–186 cm. |
| Chest-girth | 85–99 cm. | 70–106 cm. | 55–112 cm. | 67.5–96.4 cm. |
| Weight | 115–167 lbs. | 105–236 lbs. | 42–292 lbs. | 66–196 lbs. |
| | 52.2–75.7 k. | 47.6–107.0 k. | 18.9–132.9 k. | 29.8–88.8 k. |

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* After determining on this factor 91, it seemed worth while to confirm the translation of Bornhardt's factor as hitherto cited in the literature and earlier in this paper, namely:

W (in kg.)=H (in cm.)×C (in cm.) divided by 240.

Starting from Bornhardt's model: W (in Russian Funt)=H (in Werschok)×C (in Werchok)/5, I got

$$W\ (\text{in kg.}) = \frac{0.4082}{5} \times \frac{H\,(\text{in cm.})}{4.445} \times \frac{C\,(\text{in cm.})}{4.445} = \frac{0.4082}{5 \times 19.758} \times H\,C = \frac{0.4082}{9879} \times HC = \frac{1}{242} \text{ or } 4132 \times HC$$

instead of 1/240 or 417×H (in cm.)×C (in cm.) as hitherto translated.

$$\text{And } W\ (\text{in lbs. avdp.}) = \frac{0.9}{5} \times \frac{H\,(\text{in cm.})}{4.445} \times \frac{C\,(\text{in cm.})}{4.445} = \frac{0.9}{5 \times 19.758} \times HC\ (\text{in cm.}) = \frac{0.9}{9879} \times H\,C\ (\text{in cm.}) = 911 \times H\,C$$

† To be discussed in a separate paper to be published shortly in this Journal. The bibliography with the forthcoming paper will include the authors here referred to.

### SUMMARY.

For the estimation of the weight of a healthy person, the formulae of the U. S. Army and Navy, of the Medico-Actuarial Committee, of Guthrie, Broca, and of Von Noorden have been shown less accurate than Bornhardt's rule. The present study was begun with the hope of attaining even greater accuracy by some modification of Bornhardt's method. Experiments with various formulae are reported above, but the best of these was only slightly different from Bornhardt's, and was only slightly more precise, reducing the error from 5.64% to 5.61% when applied to the prediction of the weights of 305 men, collected in three different groups, aged 18 to 34 years.

We are greatly indebted for assistance in the large number of calculations here summarized, to Mrs. J. M. Walker of Lexington.

TABLE 11.—RESULTS WITH EXPERIMENTAL FORMULAE.

| | | FORMULA (H=height in cm.: C=chest girth in cm.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SERIES | HC×90 | HC×91 | HC×917 | HC×92 | HC×93 | HC×94 | $HC^2$ | $HC^2\times101$ | $H^2C\times526$ | $H^2C\times530$ |
| I | 20 Students | 5.80 | 5.70 | 5.55 | | | | 6.25 | 5.50 | 5.00 | |
| II | 115 U. S. Soldiers (selected by lot) | | | | | | | 6.64 | 6.99 | 6.48 | |
| III | 114 U. S. Soldiers (the remainder) | | | | | | | 5.99 | 5.95 | 6.46 | 6.42 |
| IV | Total 229 U. S. Soldiers | 5.79 | 6.00 | 6.00 | 6.20 | 6.60 | 7.1 | 6.31 | 6.47 | 6.48 | |
| V | Total 249 Normal Americans | 5.79 | 5.98 | 5.96 | | | | 6.31 | 6.39 | 6.36 | |
| VI | Bornhardt's 38 | 6.78 | 4.24 | 4.20 | | | | 4.47 | | | |
| VII | Bornhardt's 18 | 5.56 | 3.42 | 4.20 | | | | 3.22 | | | |
| VIII | Bornhardt's total 56 | 6.41 | 3.98 | 4.20 | | | | 4.07 | 3.78 | 4.80 | |
| X | Grand Total, 305 Normal Men | 5.91 | 5.61 | 5.64 | | | | 5.89 | 5.91 | 6.07 | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

## Book Reviews.

*Clinical Ophthalmology for the General Practitioner.* By A. MAITLAND RAMSAY, M.D., Glasgow: Oxford Medical Publications, 1920.

The author makes the following statement in his preface: "The book is not meant to take the place of a systematic treatise on Ophthalmology. It is purely clinical, deals with the symptomatology of Eye Diseases and is an attempt to present the subject as the general practitioner meets it in his daily practice."

This book can be recommended especially to the practitioner who, from choice or necessity, does his own eye work. It is rather more complete than the author's statement would indicate. Treatment is gone into minutely, and operative procedures, even the major ones, are described at some length. There are 500 pages of text, with 20 pages of plates, 11 of which are in color. Sixty pages are devoted to Therapeutic Formulae and Notes. Eye injuries and their treatment are given careful consideration. An admirable feature of the work is the arrangement of several of the chapters under the headings of signs and symptoms, thus: "The Clinical Significance of Oedema of the Eyelids," "The Clinical Significance of Failing Sight." With such an arrangement, the reader is at once shown the possibilities of his case and is not obliged to work backward by first making a provisional diagnosis and then reading to see if the case fits his diagnosis.

*Lice and Their Menace to Man.* By LIEUT. LL. LLOYD, *R.A.M.C.* (T.) With a Chapter on Trench Fever by MAJOR W. BYAM, R.A.M.C. London: Oxford University Press. 1919.

Within the last few years there has been collected a considerable amount of information concerning the lice of man. Since the war has made it necessary to discover more about its habits in order to combat its activities, scientists have worked unselfishly on this problem for the last four years. The rôle which the louse plays in spreading disease is an extensive one, and is responsible for a large proportion of human suffering. Typhus fever, relapsing fever, and recently trench fever, are attributed entirely to the activities of the louse. This volume, "Lice and Their Menace to Man," discusses the structure of the body louse, its early development, habits of living and feeding, and its dissemination. Methods of disinfection are varied; among them are hand-picking, brushing, ironing, dry storage, heat, and treatment by chemicals and greases. The habits of the head louse and of the crab louse and means of eliminating them are also considered in this book. The results obtained from experiments conducted on soldiers to determine the migration of body lice and their effects on man are illustrated by charts and tables.

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## SHARON SANATORIUM FOR PULMONARY DISEASES.

Thirty years ago, the first state sanatorium for the care and treatment of patients with pulmonary diseases was established at Sharon, Massachusetts. Before that time, other private institutions had been organized for the treatment of tuberculosis: as early as 1857 the Channing Home had been established in Boston; in 1875 the first private sanatorium was established at Asheville, North Carolina; and in 1884 the Adirondack Cottage Sanitarium, now known as the Trudeau Sanatorium, was established at Saranac Lake, New York. In the beginning, the primary emphasis of the tuberculosis movement was laid upon cure; gradually, however, more thought was given to the prevention and early control of the disease. The step taken by Massachusetts in establishing the Sharon Sanatorium as a state institution is particularly significant, in view of the emphasis at the present time upon public responsibility for institutional care.

The Sharon Sanatorium affords opportunity for the treatment of incipient pulmonary disease arising in women and children who are unable, for pecuniary and other reasons, to go to distant health resorts. By the help of this institution, many young women, deprived temporarily of their power to earn money for their support, have been able, through rest, good food, fresh air and skillful medical supervision, to return to their occupations after a few months of residence and treatment at Sharon. In response to questionnaires which have been sent to all former patients, most gratifying answers have been received, some from patients who left the sanatorium twenty-eight and twenty-nine years ago. The public is deeply indebted to Dr. Vincent Bowditch of Boston for his untiring efforts to promote the work of this institution.

The results accomplished by the Sharon Sanatorium show how much can be done in the treatment of tuberculosis regardless of climate. Until recently, the means of meeting the tuberculosis problem in France have been entirely inadequate; but now that the experiment has been tried at Sharon, successful efforts have been made in climates formerly thought to be unfavorable to recovery. In this connection, a letter received from one who has been working with this problem in Brittany is of interest:

"When I went to Finistère, those (tuberculous patients) who could not go to an altitude or a warm climate, prepared to die at the hospital without any attempt to recover. Morlaix is called *'le puit de la tuberculose.'* With its narrow valley always full of fog, morning and evening, and lack of drainage, it is not an encouraging outlook for recovery. But the nurses had heard of Sharon, and a Mrs. Ewing, and others, and books, had told of your effort to cure, in any climate, and so, to prove it, I bought Porsmeur, situated on the hill but in the town of Morlaix. Needless to say, what had been proved at Sharon proved true in France as well. . . . In France they say, *'L'idèe, c'est la force éternelle,'* and Sharon has it and holds it. We all owe an unbounded gratitude for the conception of such a place."

Among the advantages to be found at the Sharon Sanatorium is the Children's Pavilion with its open-air school. It is to be regretted that the public, still, is not sufficiently educated as to the importance of placing in the most favorable environment children who show some tendency to tuberculosis. Physicians are aware of the necessity of recognizing that tuberculosis begins in childhood and frequently remains latent for many years before developing seriously in adult life. The new Pavilion is designed to provide the best hygienic conditions for cases of this sort. The remarkable improvement,—physical, mental, and moral,—which has been observed in children who have been placed under the care of the Sanatorium, proves beyond doubt the advisability of extending this work. In consideration of the difficulty in meeting the increased expenses at the Sanatorium, the Directors of the institution do not hesitate to make earnest appeal to the public for financial support, knowing that the work of the Sharon Sanatorium is of vital importance in controlling a most universal and insidious disease.

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## PUBLIC HEALTH AND THE SUBMERGED CLASSES.

That more than 75,000 men, women and children, out of a total population of 783,000, are dependents, delinquents, or feeble-minded and are unable either to work or fight and are a constant drain on the finances, health and morality of the State, has been shown by a survey conducted in Oregon. Moreover, more than 500 school children, out of a total school enrolled population of 32,500, were found to be more or less mentally deficient, a fact which is of much significance when it is remembered that the condition of the children of today is the best possible index to the condition of the community of tomorrow and to the future of the race.

The figures yielded by the Oregon survey are considerably lower than the average shown by the draft examination, a fact that indicates, in the opinion of the U. S. Public Health Service officers, that they are certainly not higher than those that would be obtained by similar surveys in other states. It is considered greatly to Oregon's credit that it has been one of the first states to realize the importance of the problem and to take effective steps toward ascertaining the exact facts concerning it.

The survey was authorized by the Oregon legislature and was carried out by the University of Oregon in collaboration with Dr. C. L. Carlisle of the U. S. Public Health Service. The following comments have been made by Surgeon-General H. S. Cumming:

"The making of the survey was not an easy task, for in Oregon, as in many other states, comparatively few of the types involved are being cared for in institutions. The rest are widely scattered and were practically unknown, for most of them are quiet and do not attract attention as do the insane and criminal. It was therefore necessary to build an organization to find them and report on them.

"As there was little money to pay trained workers, Dr. Carlisle enlisted volunteers, largely among the professional classes in every part of the state, and, through these, found the people, sought and collected data concerning their behavior, present history, school history, social relations (whether dependent, delinquent, or feeble-minded), and the cause of their condition.

"The prevention and correction of mental defectiveness, is one of the great public health problems of today. It enters into many phases of our work. Recent studies, made in connection with the spread of venereal diseases, have shown that feeble-mindedness is an important factor in prostitution. Work of the U. S. Public Health Service, in connection with juvenile courts, shows that a marked proportion of juvenile delinquency is traceable to some degree of mental deficiency in the offender.

"For years, Public Health Officials have concerned themselves only with the disorders of physical health; but now they are realizing the significance of mental health also. The work in Oregon constituted that first state-wide survey which even begins to disclose the enormous drain on a state caused by mental defects."

One of the objects of the work was to obtain for the people of Oregon an idea of the problem that confronted them and of the heavy annual loss, both economic and industrial, that it entailed. Another was to enable the legislature to devise a program that would stop much of the loss, restore health, bring to lives of industrial usefulness, many of those now unfit, and to save hundreds of children from growing up to lives of misery.

## MEDICAL NOTES.

Graduate Course in Clinical Ophthalmology at the Hotel Dieu, Paris.—Professor F. De Lapersonne, assisted by Associate Professors Terrien and Guilleminot, Doctor Hartant, oto-rhinologist of the hospitals, and Doctors Velter, Prelat, Monbrun, chiefs of the clinic and laboratory, will begin on the tenth of May, 1921, a graduate course, with clinical examinations, and practical work in operative medicine and laboratory manipulations. The lessons and practical exercises will be held every day in May and June. A special certificate of the Faculty of Medicine of Paris will be given at the end of the course. Doctors and students, French and foreign, who desire to take the course, should give their names to the Secretary of the Faculty of Medicine. The number of students is limited to forty. The fee is fixed at one hundred and fifty francs.

American Congress on Internal Medicine.—At the annual meeting of the members of The American Congress on Internal Medicine, held at Baltimore, Md., week of February 21-26, the following officers were elected: President, Dr. Sydney R. Miller, Baltimore, Md., Clinical Professor of Medicine, Johns Hopkins University; Vice-President, Dr. Ellsworth S. Smith, St. Louis, Mo., Professor of Medicine, Washington University; 2nd Vice-President, Dr. James Rae Arneill, Denver, Colo., Professor of Clinical Medicine, University of Colorado; Secretary-General, Dr. Frank Smithies, Chicago, Ill., Associate Professor of Medicine, University of Illinois; Treasurer, Dr. Clement R. Jones, Pittsburgh, Pa., Professor of Medicine, University of Pittsburgh.

The American College of Physicians.—At the annual meeting of the Officers and Councilors of The American College of Physicians, held at Baltimore, Md., February 25, 1921, the following officers were elected: President, Dr. James M. Anders, Philadelphia, Pa., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania; Vice-President, Dr. Frederick Tice, Chicago, Illinois, Professor of Medicine, University of Illinois; 2nd Vice-President, Dr. C. C. Bass, New Orleans, La., Professor of Research Medicine, Tulane University; Secretary-General, Dr. Frank Smithies, Chicago, Ill., Associate Professor, University of Illinois; Treasurer, Dr. Clement R. Jones, Pittsburgh, Pa., Professor of Medicine, University of Pittsburgh.

The Eye Sight Conservation Council of America.—The Eye Sight Conservation Council of America is a membership organization. The directors and councillors are professional men representing various organizations devoted to health, welfare, education, science and industrial betterment.

The following are the officers: President, L. W. Wallace, New York, N. Y., who is President of the American Society of Industrial Engineers and recently elected an officer in the newly formed Federated American Engineering Societies of which Herbert Hoover is President.

Vice-President, Casius D. Westcott, M.D., Chicago, Ill., Chairman of Committee on Conservation of Vision of the Council of Health and Public Instruction of the American Medical Association.

The other directors are: R. C. Augustine, Decatur, Ill., President of the American Optometric Association; Bailey B. Burritt, New York City, General Director New York Association for Improving the Condition of the Poor; R. M. Little, New York City, Director of the Safety Institute of America—member of the Executive Committee of the National Safety Council.

The personnel of the Board of Councillors is to be carefully selected, and so far but a few have been chosen, these being: Dr. Thomas D. Wood, Teachers' College, Columbia University. Prominent in Educational Circles and Chairman of the Joint Committee on Health Problems in Education of the National Council of the National Educational Association and the A.M.A.

Dr. Frederick R. Green, Chicago, Ill., Secretary of the Council on Health and Public Instruction of the American Medical Association.

W. S. Rankin, M.D., Raleigh, N. C., State Health Officer of North Carolina, Member Executive Committee American Public Health Association.

Arthur L. Day, Ph.D. and Sc.D., Director in charge of Geophysical Laboratories, Carnegie Institute, Washington, D. C.

Allan J. McLoughlin, M.D., Assistant Surgeon-General, U. S. Public Health Service, Washington, D.C.

Guy A. Henry, Times Building, New York City, is the General Director.

The financing has been handled in a manner quite unusual. The optical industry and trade were approached directly on the principle that a movement of this nature should first of all be supported by an industry which will ultimately be benefited. The subscribing and underwriting of a sum was realized sufficient to assure success to the undertaking. While at this stage the financing is by optical interests, generally, support is not restricted to such interests and all activities of the organization will, at all times, be conducted free from the influence of commercial interests. The form of government safeguards against the possibility of any interest gaining ascendency and assures the conduction of all activities along broad humanitarian lines strictly in accordance with the following objects:

To promote the general conservation and betterment of vision, by arousing public interest to a proper appreciation of the importance of eye hygiene and the care of the eyes, especially in so far as it pertains to defective vision and protection in hazardous occupations: Disseminating knowledge regarding the optics of the eye, the prevalence of, and the need of correcting visual errors, and of suitable protection against the special hazards and eye strain encountered in various industrial occupations: Circulating information on the proper lighting of homes, schools, factories, offices and all private and public buildings: Striving to bring about the universal eye examinations of industrial workers and of school children, both rural and urban; also, urging the importance of periodic eye examinations for everyone: Developing or improving optical aids for the alleviation of visual troubles: Compiling reliable data, publishing and circulating literature pertaining to eye care: Enlisting the aid of, and rendering service to State and Federal Governments and all departments of health and education: Coöperating with all existing agencies concerned in any degree with the movement for better vision, and striving to coördinate their efforts: To act in all of these enterprises without bias or prejudice, actuated preëminently by a desire to further the public welfare and to increase the efficiency, comfort and happiness of humanity.

The work of this organization will be of particular interest to the ophthalmologists of the country and their assistance and coöperation is desired.

Syphilis and Insanity.—That syphilis causes a substantial percentage of existing insanity has long been recognized, but heretofore definite statistics bearing on the subject have been meager. To supply this need the U. S. Public Health Service queried the superintendents of 159 state hospitals for the insane, in regard to the number of inmates who had become insane by reason of the disease. Of the 115 replies received, 88 supplied data that could be tabulated: and from this, it appeared that 15.5 per cent. of admissions and 6.2 per cent. of inmates among the men and, correspondingly, 6.1 and 2.2 per cent. among the women, were directly due to the disease. The excess in the percentage of admissions over inmates is due to the comparative short life of those who became insane by reason of the disease.

Venereal Disease and Accidents.—One of the largest telephone and telegraph companies in the United States has discovered that compensible accidents which happen to its employees bear a marked relation to the incidence of venereal disease. A large proportion of accidents to linemen, for instance, have been found to mark the beginnings of locomotor ataxia, a diagnosis which is almost always camouflage for syphilis.

American Medical Association Clinics.—The following tentative list of clinics has been prepared for the meeting of the American Medical Association in Boston on June 6 and 7:

June 6, 1921.

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| Demonstration at Eye and Ear Infirmary | 10 A.M. |
| Gynecology, Carney Hospital | 10 A.M. |
| Good Samaritan Hospital, Medical | 10 A.M. |
| Good Samaritan Hospital, Orthopedic | 10 A.M. |
| Carney Hospital, Medical | 10 A.M. |
| Free Hospital for Women, Operations by Drs. Graves and Pemberton | 10 A.M. |
| Children's Hospital, Clinic | 9 A.M. |
| Infants' Hospital, Clinic | 11 A.M. |
| New England Hospital for Women and Children | 10 A.M. |
| Peter Bent Brigham Hospital | 10 A.M. |
| Demonstrations, Infants' Hospital | 9 A.M. to 6 P.M. |
| Boston City Hospital | 10 A.M. |
| Massachusetts General Hospital | 10 A.M. |
| Floating Hospital, Clinics | 2, 3, 4 P.M. |
| Huntington Memorial Hospital | 2 P.M. |
| Peter Bent Brigham Hospital | 2.30 P.M. |
| Angell Memorial Animal Hospital, Open for Inspection. | |

June 7, 1921.

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|---|---|
| Eye and Ear Infirmary | 9 A.M |
| Boston Lying-In Hospital, Clinics | 9 A.M. |
| Carney Hospital, Medical | 10 A.M. |
| Carney Hospital, Orthopedic | 9 A.M. |
| Carney Hospital, General Surgical | 9 A.M. |
| St. Elizabeth's Hospital | |
| Infantile Paralysis Clinics, Dr. Lovett's Clinics | 10 and 11 |
| Children's Hospital | 10 A.M. |
| Infants' Hospital | 10 A.M. |
| New England Hospital for Women and Children | 9 A.M. |
| Peter Bent Brigham Hospital | 9 A.M. |
| Demonstrations of methods on anesthesia, Boston City Hospital | |
| Boston City Hospital, General Surgical | 9 A.M. |
| Massachusetts General Hospital | 9 A.M. |
| Diabetic Clinic by Dr. Joslin | 2 to 6 P.M. |
| Forsyth Dental Infirmary, Demonstrations of work interesting to doctors | 2 P.M. |
| Peter Bent Brigham Hospital | 2.30 P.M. |
| Demonstrations of Public Health Hospitals at Parker Hill Hospital | 2 to 6 P.M. |
| Angell Memorial Animal Hospital open for inspection. | |

The American Journal of Tropical Medicine.—The following announcement has been made by the American Society of Tropical Medicine in regard to *The American Journal of Tropical Medicine*, which is to be published for the benefit of physicians and research workers.

"The general experience of the medical sciences has fully demonstrated the advantages which accrue from the segregation of special subjects. A central organ for the prompt presentation of articles, that are now scattered over a wide field, or the lack entirely of a proper medium to turn to for publication, will be a great convenience to those interested in the study of tropical diseases, and also serve to stimulate the growth and development of the subject. The purpose of the new *Journal* will be to serve as a medium for the dissemination of reliable information from every source, with regard to the clinical and other phases of the nature, treatment, and prevention of tropical diseases."

The *Journal* will be published bi-monthly, by the Williams and Wilkins Company, Baltimore, Md. The transactions of the annual meetings of the American Society of Tropical Medicine, various reports, lists of members, and papers will be published in the *Journal*.

The following men are members of the editorial staff: Editor, H. J. Nichols, Medical Corps, U. S. Army, Army Medical School, Washington, D. C; Advisory Editorial Board, B. K. Ashford,, Medical Corps, U. S. Army, San Juan, Porto Rico; C. C. Bass, Tulane University, New Orleans, La.; M. F. Boyd, University of Texas, Galveston, Texas; C. F. Craig, Medical Corps, U. S. Army, Army Medical School, Washington, D. C.; George Dock, Washington University; Simon Flexner, Rockefeller Institute, New York City; William Krauss, Memphis, Tenn.; W. D. McCaw, Assistant Surgeon-General, U. S. Army, Army Medical School, Washington, D. C.; G. W. McCoy, Director, Hygienic Laboratory, U. S. P. H. S., Washington, D. C.; K. F. Meyer, University of California,, San Francisco, Cal.; E. H. Ransom, Department of Agriculture, Washington, D. C.; R. P. Strong, Harvard University; A. J. Smith, University of Pennsylvania; E. R. Stitt, Surgeon-General, U. S. Navy; W. S. Thayer, Johns Hopkins University; E. J. Wood, Wilmington, N. C. *Ex-officio* Advisory Editorial Board, The American Society of Tropical Medicine: J. M. Swan, President; K. F. Meyer, 1st Vice-President; V. G. Heiser, 2nd Vice-President; S. K. Simon, Secretary and Treasurer; George Dock, Councillor; C. L. Furbush, Councillor; J. F. Siler, Councillor; J. H. White, Councillor; C. S. Butler, Councillor.

General Staff College at Washington.—A plan to have prominent physicians deliver addresses before the General Staff College at Washington, has been made by Surgeon-General Ireland. Two physicians who recently have addressed the College are, Dr. Joel E. Goldthwait of Boston and Dr. Thomas W. Salmon of New York.

## BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending March 19, 1921, the number of deaths reported was 233 against 251 last year, with a rate of 16.04 against 16.19 last year. There were 36 deaths under one year of age against 52 last year.

The number of cases of principal reportable diseases were: Diphtheria, 71; whooping cough, 36; scarlet fever, 70; measles, 101; tuberculosis, 49.

Included in the above, were the following cases of non-residents: Diphtheria, 9; scarlet fever, 4; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 5; whooping cough, 1; scarlet fever, 3; typhoid fever, 1; measles, 2; tuberculosis, 23.

Included in the above, were the following non-residents: Diphtheria, 3; scarlet fever, 1; tuberculosis, 2.

Encephalitis lethargica: Cases, 3; deaths, 2.

Health Statistics in Boston.—For the week ending March 12, 229 deaths,—128 males and 101 females,—were reported by the Health Department of Boston. Of the deaths, 28 were due to pneumonia, 11 of lobar pneumonia and 17 of broncho-pneumonia; cancer, 18; nephritis, 15; tuberculosis, 10; diphtheria, 2; measles, 2; whooping cough, 2; influenza 1; syphilis, 2; diarrhea and enteritis, 3; erysipelas, 3; non-reportable diseases, 84; heart disease, 28; accidents and violence, 10; encephalitis lethargica, 1; septic sore throat, 1. Eighty-six of the deaths were among people over 60 years of age; 47 occurred among children five years of age. The number of deaths in public institutions was 119.

Somerville Medical Society.—A meeting of the Somerville Medical Society was held on March 10, with seventy-five members present. The Legislative hearings on the Maternity bill were reported by Dr. Charles E. Mongan. There was a general discussion of the proposed changes in telephone charges, and a committee including Dr. Herbert E. Buffum, Dr. Edmund H. Robbins, and Dr. Eugene L. Maguire, was elected to investigate the matter of increased rates in behalf of the Society.

Dr. George C. Mahoney presented recommendations that stricter laws be enacted to enforce compulsory vaccination, and that the health authorities of the State circulate literature explaining the dangers of smallpox and the benefits of vaccination. The recommendations were accepted. Drs. Arthur N. Makechnie, Francis Shaw and Edward L. McCarty were appointed a committee to bring to the attention of the public, its rights in the employment of physicians in industrial accident cases provided for in the Workmen's Compensation Act.

## Correspondence.

### IDENTIFICATION OF BABIES.

Springfield, Mass., March 5, 1921.

*Mr. Editor:—*.

The letter in your correspondence column in the current issue, on a new method of baby identification used in Boston, leads me to describe a somewhat similar method which has been in use at the Wesson Maternity Hospital, in this city, for eight years.

We maintain a supply of solid silver neck chains heavy enough for strength, but not to hurt the baby's skin. They are in such lengths as will not slip over the baby's head, 12 inches being right for the average baby. We also keep the small size oval, metal rim commercial tags and a bottle of white shellac.

Before a baby is taken from the delivery room, its mother's name and her room or wardbed number is written in ink on the tag which is dipped in the shellac, drying instantly, waterproofing it. The tag is slipped on a chain, which is clasped around the baby's neck and never removed till discharge. Sterilizing makes the chains again ready for use. The racks on the cribs in the nurseries, of course, contain cards with all the usual data. The initial cost of the chains is not great and they last indefinitely, except that the spring clasps have to be renewed occasionally at a cost of 25 cents. Some mothers like to have the chain as a souvenir and we sell them at a small profit.

We hear not a word of fear that the babies may get mixed. The numeral system described by your correspondent seems to me open to easy mistakes of the figures 6 and 9. Our method has been well tried out as we have a thousand cases a year.

Very truly yours,
George C. McChan, M.D.,
Secretary, Board of Managers.

## SOCIETY NOTICES.

New England Pediatric Society.—The sixty-ninth meeting of the New England Pediatric Society will be held at the Boston Medical Library, Friday, April 8, 1921, at 8.15 p.m.

The following papers will be read:

"Otitis Media in Infancy and Childhood."
George Tobey, M.D., Boston.

"The History of Child Care as Reflected in Ancient Art."
John Foote, M.D., Boston.

Light refreshments will be served after the meeting.

Henry I. Bowditch, M.D., *President*,
Lewis Webb Hill, M.D., *Secretary*.

Boston City Hospital.—Staff Clinical Meeting, Cheever Amphitheatre, Friday, April 8, 1921, at 8.15 p.m.,

TOPICS.

1. "Diphtheria Bacillus Carriers: their Practical Significance." Dr. W. L. Moss.
   Discussed by Dr. Edwin H. Place.
2. "The A-B-C's of Blood Examination." Dr. T. E. Buckman.
   Discussed by Dr. Ralph C. Larrabee.
3. "The Practical Significance of Certain Laboratory Tests for Nephritis and Diabetes." Dr. R. W. Ohler.
   Discussed by Dr. David L. Edsall

Dr. Edwin A. Locke will preside.

Physicians and medical students invited. Open discussion.

Dr. Halsey B. Loder,
Dr. H. Archibald Nissen,
*Committee*.

## RECENT DEATHS.

Dr. Miles A. Jewett, United States Consul at Trondhjem, Norway, died on February 25. Dr. Jewett was born in Turkey, the son of the Rev. Fayette Jewett, a medical missionary of the American Board in Turkey. Dr. Jewett received his medical degree from Harvard University in 1881. For a number of years he was physician at the State Insane Hospital at Danvers. From 1885 to 1893 he was a Fellow of the Massachusetts Medical Society. Dr. Jewett is survived by his widow, Mrs. Frances (Dudley) Jewett.

Wilhelm Von Waldeyer.—Announcement has been made of the death of Wilhelm Von Waldeyer, professor of anatomy at the University of Berlin, at the age of eighty-five years.

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# Address

## ANCIENT EMPIRICISM VS. MODERN EVIDENCE.*

BY JOHN B. DEAVER, M.D., PHILADELPHIA.

IT is a pleasure to me to be with you on this occasion which to me represents an expression of the spirit of fellowship and coöperation among the members of our professional fellow-citizens of this state. At the same time, I would like to express the hope that in the near future there may be found a way for you to join forces with the state branch of the national organization, of which I have the honor of being President-elect, so that there may be that one hundred per cent. coöperation so essential to improving and maintaining the standards of our calling.

I cannot help yielding to a natural and compelling impulse to preface what I have to say to you this evening by extending to the future vice-president the congratulations of this assembly, both in its professional capacity and its capacity as loyal Americans on the complete and signal victory experienced at the polls. There is every reason, not so much to hope as to believe, that the prospective change in administration must result in the improved conditions so anxiously awaited by the country at large. This is neither the time nor the place to enter into a discussion of the disadvantages under which this country has been traveling for the past few years. But it is both proper and fitting to express gratification at the turn of events and to pledge our enthusiastic support to the new heads of our national government. This pledge is all the more significant because it is given also to a scion of your state and because of the important rôle played by Massachusetts in the history of these United States. It is but maintaining its tradition in giving one of its sons the opportunity of helping to add another illustrious page to that glorious history of Massachusetts. Not only to the Vice-President-elect, but also to the Governor-elect of the state, it gives me pleasure to offer my best wishes for his success in continuing the policy which led to the choice of Governor Coolidge for the high office to which he has just been elected.

But not alone in the political history of our country does Massachusetts stand supreme, in medical annals also she occupies an enviable position. If there were no other achievement to her credit than that within her borders were first published the experiments that resulted in the boon of anesthesia, it were enough to emblazon the name of Massachusetts in bold letters on the honor roll of our guild. Not content with this signal victory, she has enriched and is still enriching our profession with a galaxy of names which represent and will always stand for the highest ideals and accomplishment. The list of epoch-making contributions furnished to the medical sciences by physicians of Massachusetts, and more especially of Boston, is no mean one. Many of these were pioneers in their special fields. In the early days you gave us the Warrens, Keep, the Bigelows Hare, Fischer, the inventor of the cystoscope; then the beloved poet-physician, Oliver Wendell Holmes, whose discovery of the cause of puerperal fever paved the way for the protection of the mother at her critical time, and has spared countless lives; and Reginald Heber Fitz, the revealer of the true malefactor in the disease which bears the name he gave it, and who also shed light on the rôle of the pancreas in certain, then obscure, abdominal conditions; Maurice Richardson, whose acumen and forethought have done much to place surgery in the estimable position it now holds. And thus I could go on. The list is a large one and, no doubt, more familiar to you than to me. You and we are fortunate in having still with us, men of Massachusetts who continue to form the Hub from which new ideas and new methods continue to radiate to all parts of the globe, and who are keeping alive the traditions of pioneer New England.

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* Read before the meeting of the Clinical and Surgical Association of Massachusetts, Boston, Nov. 9, 1920.

There are certain topics that never lose their interest, and among these I believe the early efforts in surgery retain a remarkable fascination. The art of surgery is as old as history itself, and in the course of time it has come to embrace every part of the human organism. In the chronicles of the ages surgery apparently antedates medicine, the latter being more intimately bound up with religion and with priestly functions, and at all times the former has carried with it a greater responsibility than the practice of the healing art as such. We see this in the Babylonian code of laws in which, we are told, the blame for failure of an operation rested entirely upon the surgeon for his lack of judgment in taking the risk. The punishment for bad surgery was made to fit the crime, and also the patient. If an unsuccessful operation was done on a slave, that is, if the patient—a slave—lost an eye, for example, the bungling surgeon was obliged to pay half the value of the slave; if the patient died, a new slave was required of the operator. If the victom was a free man, the penalty in either contingency—the loss of an eye, or death—consisted in cutting off the hand of the operator. Not an unwise precautionary measure, fortunately (or unfortunately) not applicable today! The early Roman laws were equally severe on the erring surgeon. If, when called upon to bleed a patient, he drew too much blood, he was obliged to pay a liberal indemnity to his patient, and if the latter died, the surgeon's life was at the mercy of the family of the defunct. If the patient happened to be a slave, restitution of a slave of equal value was required. The law, however, dealt more leniently with the physician, although failure to cure was attended with loss of his fee. But, according to the naïve statement of an ancient document the physician is better able to hide his mistakes than is the surgeon, and so we may presume that the doctors of those days collected their fees pretty regularly.

The surgeon of other days likewise labored under the disadvantage of occupying a lower social and professional status than the physician. Manual treatment of any kind being considered beneath the dignity of the medical practitioner, the surgeon was called upon to act as hands to the latter, so that surgery became a sort of trade followed principally by barbers. It is only within comparatively recent times that the two professions have been put on an equal footing. The attainment was not a sudden nor an easy one. It has been a slow, steady evolution not unattended by revolution with many battles fought and lost, and a few won. For surgery at all times has been "up and doing," and "still achieving, still pursuing," it has learned "to labor and to wait." Indeed, it waited for many centuries for the dawn of modern scientific methods. The long night did not begin to break until the middle of the 19th century, when Morton presented to a waiting world the balm of anesthesia. And the bright light of day, bringing in its trail the scientific era of surgery, did not come until Pasteur discovered the cause of wound infection and Lister the possibility of its prevention .

We do well to bear in mind that much of our progress represents a change in method rather than in principle. The basic principles of surgery do not change. The monks of the middle ages smeared the wounds of their patients with pitch, with more or less beneficial results. Similarly empiric were the methods adopted in subsequent times for keeping wounds clean; today we know the why and wherefor thereof and call it infection, antisepsis and asepsis. Considering the lack of exact knowledge and the utterly primitive facilities at the disposal of the surgeon of old, it is indeed surprising that anyone ever survived an operation. We cannot help feeling that Paré (1510-1590), known as the father of modern surgery, was right when on being asked about the condition of one of his patients, said, "I do the operating, God heals the wound." But by the God-given light in which we are working in this age, a much greater responsibility rests upon the work of human hands, and lack of success cannot so conveniently, as formerly, be shifted, or attributed, to a visitation of God.

Before the advent of the present, the pathological, era of surgery, surgical procedures were mainly concerned with acute injuries, fractures, tumors, the removal of stones from the bladder, ligation of arteries for the cure of aneurisms, etc. Other regions in the body were truly forbidden ground which only a daring few ventured to tread, and some indeed were altogether *terra incognita*. Since the dawn of modern science of surgery, the sign-posts, "No trespassing," have almost disappeared from the path of the aseptic scalpel and there is practically no part of the human organism which in the hands of the adept it cannot reach. Today we remove tumors from the brain, perform delicate operations on the eye, the ear, the nose, the throat and the lungs; we resect the stomach, remove the gall-bladder, extirpate a kidney, suture the liver and the heart, reunite severed nerves and arteries, and, to some extent, restore lost tissues and replace bones by which form is conserved and function reëstablished in deformed and diseased parts of the body.

We owe the removal of the barriers which formerly blocked the path of surgery to the development and the triumphant entry into its realm of the pathology of the living, along with its sister sciences—bacteriology, serology, experemintal physiology, bio- and physico-chemistry, radiology, etc. This does not imply that we are through with the study of anatomy, for now, as always, the road to good surgery leads to and from the dissecting room. The difference is that today we are in a position to compare normal and pathological conditions in the living subject, and are thus gaining a better insight into the nature and cause of the disease and possible prevention.

This subject of the pathology of the living likewise never loses its interest for the surgeon, provided he is not merely an operator, but a student. It has contributed more than anything else to the advance of the medical sciences and the saving of human life. The possibilities opened up by observations on the living subject are as long as the chain of progress from the dark beginnings of surgery down to our own epoch with its almost phenomenal opportunities and achievements. To this study we owe the clarification of many of our ideas concerning such disorders as duodenal and gastric ulcers, disease of the gall-bladder, the bile passages and the pancreas, tuberculosis, and so through the list.

In disease of the gall-bladder, for example, it is possible to trace the steps in the progress of the disorder from its first infection through the activity of micro-organisms, through the stage of acute and chronic inflammation with its attending complications, gall-stone formation and possible precancerous and cancerous change. There is at present considerable propaganda which claims that opening up the abdomen is not the most rational means of establishing the cause of persistent abdominal symptoms; that by means of such devices as the duodenal bucket, disease of the biliary passages can be definitely diagnosed and eventually cured. The experimental work of the late lamented Meltzer, in demonstrating the action of certain agents that are carried into the duodenum and their influence on the sphincter of Oddi have been long familiar to all of us. I believe, also, there are many who will agree with me that these experiments, interesting in themselves, have not been fruitful of much practical good, although there are some enthusiasts who are building card houses on the basis of these observations. No one more than myself would hail with delight the means of curing disease of the gall-bladder without operation; but for the present I believe that is the only means of making the diagnosis with certainty in otherwise obscure cases and of treating them with a great probability of cure. No one more than myself likewise is conscious of the stubborness of biliary infection and how long it sometimes takes to obtain a cure by direct drainage; yet we know that our results, once obtained, with the exception of a small percentage, are not only permanent, but brilliant.

One of the startling facts demonstrated by the study of disease in its progress instead of at its end-result on the autopsy table, is the disposition to cancerous degeneration of chronic ulceration of the pyloric antrum. Our increasing knowledge of cellular pathology in neoplastic tissue removed at operation has entirely changed our views with regard to cancerous changes. This is one of the reasons why excision of duodenal and gastric ulcer is a common surgical procedure today. Indeed, what we know of the clinical history of these ulcers we owe to the systematic coördination of clinical manifestations with the pathology seen at the operating table. Examples of the contribution, made by thi smeans of study to our knowledge of surgical diseases of the abdominal viscera alone could be multiplied almost *ad infinitum*. I trust that the mere glimpses I have presented in these rather disjointed remarks of the importance of this ever-fascinating and interesting topic may be of value in stimulating the desire to trace symptoms of certain diseases, especially of the gastro-intestinal tract, to their actual physiological and pathological causes. It is only by this means of proper coördination and rational treatment that we can hope to strike from our register chronic invalidism from diseases that are curable if given the proper study and consideration based on the study of living pathology instead of on disease in its terminal stage.

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## Original Articles.

# BASAL METABOLISM AS AN INDEX OF TREATMENT IN DISEASES OF THE THYROID.*

By Frank H. Lahey, M.D., Boston,
and
Sara Murray Jordan, Ph.D., Boston.

The study of metabolism is the investigation of the changes occurring in substances which pass through or become incorporated in the body cells, and of the changes in energy which accompany these processes. In other words, metabolism means chemical changes or changes in the material composition of the body (Stoffwechsel), and dynamic changes or changes in energy (Kraftwechsel).

In 1780, Lavoisier and Laplace formulated and proved the hypothesis that life is a process of oxidation supported by respiration. The experimental proof was the measurement of the heat produced by a guinea pig in an ice chamber, and of the carbon dioxide given off by the same animal when placed for a certain time under a glass jar. Lavoisier's assumption that the heat measured was produced by carbon and hydrogen burned in the lungs and excreted in water and carbon dioxide was later corrected when Liebig, in 1842, and his disciples classified the food-stuffs and showed that heat was produced by the oxidation of protein, carbohydrate, and fat in the cells of the organism.

The second great advance was made in 1851, when the law of conservation of energy, then being applied by Helmholtz to all the realms of physics, was shown by Mayer to be applicable likewise to the production of heat by the human body. It was thus demonstrated that energy and matter have the same behavior in the realm of physiology as in that of inanimate nature. Furthermore, it was found that in addition to heat produced by the animal body, the work of muscle contraction, electricity, and even light, as in the firefly, resulted from the transformation of the potential energy of the intake. Later, in 1857, followed the work of Carl von Voit, who first definitely proved that the nitrogen excretion of urine and feces could be used as a measure of the protein in metabolism. Pettenkofer and Voit demonstrated with their respiration apparatus and their chemical analyses of the excretions that the protein, fat, and carbohydrate of the intake could be measured in the carbon dioxide and nitrogen excretions.

Rubner, in 1885, and subsequent years, established the standard fuel values of 1 gram of protein, 1 gram of fat, and 1 gram of carbohydrate as 4.1, 9.3, 4.1 calories, respectively. These values are in use today. With their aid and with the application of the law of conservation of energy, it became easy to calculate the quantity of heat which under normal conditions would be produced by the oxidation of a certain amount of absorbed food-stuffs in 24 hours. When the unabsorbed food-stuffs in feces and urine were analyzed and subtracted from the intake, the calculated heat was found to correspond exactly to the heat actually given off.

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* We wish to express our appreciation to Dr. Thorne M. Carpenter of the Carnegie Nutrition laboratory, and Miss Edna Tompkins for advice and assistance in the development of the technique of this test.

It was now clear that the metabolism of man could be measured. Then began the long and productive series of investigations of the metabolism of single substances, of single organs or tissues, and of the animal organism as a whole. In the study of the metabolism of the human organism, the variations dependent upon age, sex, height, weight and composition of the body, the influences of temperature, sleep, and other conditions, the great variations in normal metabolism, under the influence of increased or decreased functional activity and chemical substances—the factors which alter metabolism—have all been carefully investigated. The results of these investigations show very definitely that although metabolism may not yet be a "precisely exact science," yet it is possible to express its rate in figures, and in the words of Robert Mayer, "One figure has more true and permanent value than a precious library full of hypotheses." To be sure, figures have their true and permanent value only when obtained by a method which combines accuracy of measurements with a definition of experimental conditions.

The investigations of the metabolism of man have dealt with quantitative variations of normal processes and of pathological conditions as compared with normal. In the comparison of pathological with normal metabolism, a definition of experimental conditions is indispensable. The definition of experimental conditions in the measurement of metabolism has come to be known as the measurement of "basal metabolism." Basal metabolism was expressed by Rubner as "Grundumsatz" or "Ruheumsatz" and in English has been defined as the condition of minimal of fundamental exchange, the irreducible minimum of exchange of energy which is characteristic for the individual. It is the minimal activity of the body which maintains the functions of respiration, circulation, and secretion. Magnus Levy and Johannson have shown that the variations for one individual are very slight under normal conditions.

In the last twenty-two years it has been recognized that in a test of the rate of basal metabolism, digestion and voluntary movements must be eliminated. To accomplish this the patient is tested twelve to fifteen hours after the ingestion of food and while completely at rest. Digestion is eliminated because it has been found that the presence of food in the alimentary canal stimulated metabolism. The importance of complete muscular repose and relaxation is shown by the fact that very slight voluntary and reflex movements or even the maintenance of an uncomfortable position requiring the tension of certain muscles raise the metabolism ten to twenty per cent. or higher. Complete relaxation of the body of the patient in a comfortable reclining position, the most thorough avoidance of all movements, together with his abstinence from food for at least twelve hours previous to the test, are the necessary conditions for a test of his basal metabolic rate. External influences, such as abnormal light, noise, physical or psychical stimuli, should be avoided, since it has been found that slight deviations from the basal rate are produced by the reflexes (respiratory, cardiac, and muscular) which such stimuli elicit.

Two methods have been developed for measuring metabolism. Direct calorimetry, the direct measurement of the heat evolved by the absorbed food-stuffs, was elaborated and applied to man in the calorimeter of Atwater and Rosa, with further developments by Benedict. An indirect method, a determination of the respiratory exchange, has also been developed by which the measurement of oxygen absorbed or carbon dioxide excreted, or both, can be used to calculate the total heat production.

The basis upon which this method was established is the fact that definite amounts of absorbed oxygen are used and likewise definite amounts of excreted carbon dioxide and of evolved heat are obtained by the oxidation to their end-products of food-stuffs of definite composition. It is therefore clear that a certain volume unit of oxygen or of carbon dioxide corresponds to a certain definite amount of liberated heat according to the substance oxidized. This definite amount of heat is the calorific value of oxygen or of carbon dioxide. A liter of oxygen has a calorific value in the combustion of protein of 4.600 calories, in the combustion of carbohydrates, 5.047 calories, and in the combustion of fat, 4.686 calories. A liter of $CO_2$ derived from the combustion of protein, carbohydrate, and fat, corresponds respectively to 5.683 calories, 5.047 calories, and 6.694 calories. When the amount of oxygen absorbed or of carbon dioxide excreted by an individual is known for a certain period of time, the calories produced by him can be computed by using a certain calorific value for oxygen or carbon dioxide, which value depends on the nature of the substances metabolized. (The choice of calorific value will be discussed below.

This indirect or gasometric method of calorimetry has been developed in two ways: (1) for the measurement of excreted carbon dioxide and absorbed oxygen, for longer periods of time (up to 24 hours), as illustrated by the apparatus of Rubner, Pettenkofer and Voit, Tigerstedt-Sonden and Jacquet; (2) for the measurement of gas exchange in the lungs, *i.e.*, the absorption of oxygen and exhalation of carbon dioxide for brief periods of time (ten minutes to one hour). The latter is the older method of the French and English scientists, elaborated by Speck (1892), and developed by Zuntz-Geppert (1905), and by Benedict in his "Universal Respiration Apparatus" (1912). These apparatus are of two types, the closed circuit and the air current types. As an example of the latter, the widely used apparatus of Tissot (1898), (1904), may be mentioned, in which a spirometer is used to record graphically the expired volume of air from which a sample is later analyzed.

An example of the closed circuit type of apparatus, which has the advantage of requiring no gas analysis for the computation of results, is that used in this present series of tests, the Benedict Portable Respiration Apparatus, devised by Benedict in 1918, and in use in the laboratory at the New England Deaconness Hospital since October, 1919.

The apparatus is described by Benedict in the Boston Medical and Surgical Journal, May 16, 1918. The essential feature is the connection between the lungs of the patient and a spirometer, filled with a mixture of room air and oxygen. This connection is made by means of a rubber mouthpiece which connects the mouth of the patient with pipes leading to and from the spirometer. Nasal breathing is shut off by the use of a nose clip. A closed circuit is thus established which includes the lungs of the patient, the spirometer which rides up and down on water with each respiration, and two jars of sodium hydroxide which are placed within the circuit to absorb the carbon dioxide as it emanates from the lungs. An electric motor is used to blow the air around the circuit.

CHART I.

RATE OF BASAL METABOLISM.

*Name*—Miss J. A. F. *Date*—Sept. 29, 1920

Date of birth—July 5, 1898 (22 yrs.)
Body weight—132.5 lbs. (61.33 kilo.)
Height—162.2 cm.
Surface area—1.65 sq. M.
Buccal Temp.—98.2°

No. of period—1 { Period begun—7.22 A.M.
Duration of period—9 min. $2^{3}/_{5}$ sec.
(9.043 min.)

| *Barometer Reading* | | *Temp. of Spirometer* | |
|---|---|---|---|
| Log. 769 ..... | 2.88593 | Begin | 27.5° C. |
| Log. 760 ..... | 2.88081 | End | 28.0° C. |
| | 0.00512 | Av. | 27.75° C. |

| *Pulse* | *Respiration* | *Temp. Reduced to Standard* | |
|---|---|---|---|
| (96) | (18) | | |
| 86 | 12 | Log. 273 .. | 2.43616 |
| 96 | 12.5 | Log. 300 7— | 2.47813 |
| 100 | 14 | | |
| 98 | 15 | | 9.95803—10 |
| 96 | | | |

*Readings of Height of Spirometer*

| | | |
|---|---|---|
| Beg. | 7170 | |
| 2 min. | 6600 | 570 |
| 4 min. | 6000 | 600 |
| 6 min. | 5400 | 600 |
| 8 min. | 4820 | 580 |
| 9 min. $2^{3}/_{5}$ sec. | 4470 | 350 |
| | 2700 — | 2700 = { Diff. in readings of height of spirometer for period. |

| | | |
|---|---|---|
| Log. diff. height spir. ........ | 3.43136 | |
| Log. temp. standardized ...... | 9.95803—10 | |
| Log. bar. standardized ....... | 0.00512 | |
| Log. vol. oxygen absorbed ... | 3.39451 | |
| Log. duration of period ...... | 0.95631 | |
| Log. vol. $O_2$ absorbed per min. | 2.43820 | = 274.3 c. c. |
| Correction for total vol. air .. | | 1.0 c. c. |
| | | 275.3 c. c. |

CHART I.—A post-operative observation. Pulse and respiration readings in parentheses were made just before the period was begun. The others were made at two-minute intervals during the test. For control during the test, the differences in the two-minute readings of the height of the spirometer are quickly calculated and compared. The patient is allowed to breathe into and out of the apparatus for 1.5 minutes before the first reading is made. Spirometer readings are made at the end of expirations. A correction of 2 c.c. for each degree C. rise in temperature is made for reduction of total volume of air to 0 degree C. and 760 mm. pressure.

Readings are made of at least two periods of about ten minutes each. If the results are found to vary too greatly from each other, further readings are made.

The absorption of oxygen by the lungs of the patient is measured and can be directly read on the scale of the spirometer (Chart I). The excretion of carbon dioxide can likewise be determined by weighing, before and after the test, the jars of sodium hydroxide which absorb it. The latter method is, however, not as desirable as the former, inasmuch as the carbon dioxide excretion has been found to be more affected by abnormal respiration than the oxygen absorption, and since, furthermore, the calorific values of carbon dioxide deviate more from one another than do those of oxygen.

As the amount of oxygen absorbed by the patient corresponds to a definite amount of liberated heat, according to the substance oxidized, the calorific value of oxygen is the next consideration. This is dependent upon the relationship of carbon dioxide to oxygen, or the respiratory quotient, which varies according to the nature of the material metabolized. From a study of respiratory quotients by Benedict and others, 0.82 has been found to be an average. The calorific value of oxygen corresponding to this average respiratory quotient is 4.825, as determined by Zuntz and Schumburg. By multiplication of the amount of oxygen absorbed per minute (measured by the spirometer and reduced to a standard temperature and barometric pressure), by the calorific value 4.825 the number of calories produced per minute is obtained. It is now necessary to compare this actual heat production of the individual with a standard of norm (Chart II). Here we are confronted with a situation inevitable in a science which is not "precisely exact." In the words of Dr. Benedict, "There is no inflexible standard for normal metabolism for any given age, weight, height, and sex, from which all normal individuals never vary." The most widely used method for computing normal metabolism has been, in the past, the calculation based on the "body surface law," the underlying conception of which is that the amount of heat produced by the body is proportional to the surface area rather than to the weight. In 1883, Rubner published the results of experiments which seemed to demonstrate the existence of an "emission constant," or constant heat production per unit of body surface. The conception had been held for several decades previous to Rubner's work, and Richet published experimental data in 1889, but the law is commonly known as Rubner's Law. The physiological evidence for the validity of this law has been discussed by Benedict in 1919, and shown to be inconclusive. Nevertheless, this law has been in common use as the basis of the measurement of normal metabolism.

### CHART II.

SHOWING CALCULATION OF PERCENTAGE VARIATION FROM NORMAL, BASED ON OBSERVATION SHOWN IN PLATE I.

Miss J. A. F.

*Actual Basal Metabolism*

Vol. oxygen absorbed per min. { Period 1....275.3 c.c.
Period 2....275.1 c.c.

Average ......275.2 c.c.

$$\frac{275.2 \text{ c.c.}}{1000 \text{ c.c. (1 litre)}} \times 4.825 \text{ (cal. val. of 1 litre } O_2) =$$

1.32784 calories per minute

1.32784 x 1440 (minutes per day) = 1912.0896 calories per day

*Normal Basal Metabolism*

1. Harris and Benedict Method (Prediction Tables)

Height and age ............ 197
Weight ..................... 1241

1438 calories per day

2. Du Bois Height Weight Chart and Linear Formulas

Surface area ........................ 1.65 sq. M.

1.65 x 37 {(Av. calories per hr. per sq. M. of body surface of women, 20 to 29 years)} = 61.05 calories per hr.

61.05 x 24 (hrs. per day) = 1465.20 calories per day

*Comparison of Normal with Actual Basal Metabolism*

(To obtain percentage variation from normal)

(H. & B.) 1438 : 1912.0896 = 100 : X
X = 132

Percentage variation from normal +32

(Du B.) 1465 : 1912.0896 = 100 : X
X = 130

Percentage variation from normal +30

The measurement of the surface area of man has been accomplished in various ways, such as the covering of the body with paper and the measurement of the area of the paper or a protographic method with the measurement of the prints by means of a planimeter. Formulae were made from such measurements by which surface area can be computed from the height and weight of an individual. The linear formula and the height-weight chart of Du Bois and Du Bois, published in 1915, are widely used today.

However, in 1919, Harris and Benedict published the results of their biometric studies of the basal metabolism of man, in which they showed from a statistical analysis of the metabolism of over two hundred normal individuals, together with the correlation of the factors for their body weight, stature, age, and sex, that the proximate factors determining the metabolism are the body weight, height, age, and sex, all of which have an independent influence upon metabolism. From their analysis of these factors they have established new formulae, and from these formulae have made multiple prediction tables for the basal metabolism of the two sexes between the ages of twenty-one and seventy. These tables have been used in this series of tests, and it may be stated that in general the values thus determined conform with the clinical aspect of the cases. Comparisons have frequently been made with computations based on the DuBois height-weight chart and linear formula and slight deviations have been noted (Chart III).

Chart III.

Showing Variations in Estimated Rate of Basal Metabolism by Comparison with Harris and Benedict and with Dubois Normals. (10 Cases.)

| Name | Age Years | Height in Cm. | Weight in Kilo. | Harris and Benedict Method | DuBois Method |
|---|---|---|---|---|---|
| Mr. B. | 26 | 166 | 54.4 | +59 | +55 |
| Mrs. A. | 28 | 161 | 45.4 | +66 | +63 |
| Miss I. | 20 | 151 | 46.1 | —26 | —23 |
| Mrs. B. | 51 | 156.5 | 71.1 | —7 | —11 |
| Mrs. F. | 42 | 174.5 | 61.9 | —14 | —22 |
| Mrs. P. | 27 | 162 | 46.5 | +36 | +33 |
| Miss F. | 22 | 162 | 61.3 | +32 | +30 |
| Mrs. P. | 43 | 158.5 | 40.9 | +44 | +38 |
| Miss F. | 25 | 153 | 54.7 | —3 | —4 |
| Mrs. P. | 42 | 153 | 35.6 | +28 | +28 |

Therefore, although it can not yet be stated absolutely that an individual with a basal metabolic rate within ten points of the standard or norm (as determined by either of the above methods outlined), is actually within *his* normal metabolic limits, yet it can be assumed that the deviation from his norm is not great. Until further statistical data are collected, the greater value of the determination of a basal metabolic rate must remain intra-individual, that is, in the comparison of the basal metabolic rates of the same individual under different circumstances, as, for example, under surgical treatment as in this series.

In addition to the possible error arising from comparison of the actual basal metabolic rate with a norm which is relatively indefinite, another source of error lies in the technique of the measurement. The experimental conditions have been described above. To avoid gross errors, these conditions must be strictly observed. Furthermore, the condition of the apparatus itself offers possibilities of error. It must be carefully tested for leakage before each test and the soda lime must be renewed often enough so that it remains an efficient absorber of carbon dioxide. Otherwise, the patient suffers great discomfort from the absorption of carbon dioxide and its presence in the spirometer interferes with the measurement of oxygen. Careful and accurate readings and computations are, of course, also necessary. In the experience derived from this series of tests, it has been found that the chief sources of error in technique arise from two defects in the condition of the apparatus, namely, leakage (usually at the joints, due to defective washers), and non-absorption of carbon dioxide by the soda lime. Either condition produces so considerable a deviation from the correct value as to make the results worthless.

In this series, 304 tests have been made upon 135 individuals, 25 of whom were normal controls.* The other 110 individuals were patients suffering from diseases of the thyroid, namely, simple adenomata, adenomata with secondary hyperthyroidism, primary hyperthyroidism, or hypothyroidism.

Basal metabolism as a diagnostic measure, although subject to error in estimation and interpretation, is probably more constantly reliable than many of our other laboratory measures, both as to its qualitative and quantitative value. It is of the greatest value in hyperthyroidism, since that disease is so distinctive in its course and symptoms, and so characteristically a disease of hypermetabolism.

From our experience in metabolism studies in connection with thyroid disease, involving 304 metabolism estimations on 135 patients, it does not seem that active hyperthyroidism exists without an increase in the metabolic rate.

Such study is of great value in separating those cases of neurasthenia and associated neurological and cardiac lesions, such as effort syndrome, which often present signs closely simulating those of hyperthyroidism, in that these conditions show metabolism estimations within normal limits.

It is of value, further, in determining the presence of secondary hyperthyroidism in those cases of adenoma of the thyroid in which the symptoms of hyperthyroidism are not markedly evident. It used to be a source of considerable surprise to us in the beginning of our thyroid experience, before we were accustomed to employ basal metabolism estimation, to find that many patients upon whom we operated merely to remove an adenoma which was either causing pressure or was unsightly, came back within a few months, having gained in weight, and stating that they felt a marked change in their general health. This we now know to have been an improvement from secondary hyperthyroidism which, when well marked, is—with the exception of exophthalmos—similar in every way to primary hyperthyroidism, and no more difficult to demonstrate. Its presence, however, in mild or pre-states of clinical hyperthyroidism is not easily demonstrated clinically, but even slight degrees of secondary hyperthyroidism are demonstrable by increases in the rate of metabolic activity, examples of which are shown below as pre-and post-operative metabolism determinations (Chart IV).

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* The data discussed in this paper are those gathered up to October 1, 1920.

CHART IV.

SHOWING PRE- AND POST-OPERATIVE BASAL METABOLISM ESTIMATION IN A FEW CASES OF SECONDARY HYPERTHYROIDISM.

| NAME | AGE | DATE | PULSE RATE | BAS. MET. RATE | OPERATION |
|---|---|---|---|---|---|
| Mrs. B. | 25 yrs. | Mar. 18, 1920 | 118 | +55 | |
| | | Mar. 19, 1920 | | | Excision of adenoma |
| | | Mar. 30, 1920 | 108 | +32 | |
| | | Apr. 27, 1920 | 86 | +12 | |
| Mrs. B. | 34 yrs. | Mar. 11, 1920 | 96 | +36 | |
| | | Mar. 12, 1920 | | | Excision of adenoma |
| | | Mar. 24, 1920 | 62 | +15 | |
| Miss C. | 26 yrs. | Jan. 9, 1920 | 90 | +20 | |
| | | Jan. 10, 1920 | | | Excision of adenoma |
| | | Jan. 16, 1920 | 74 | +12 | |
| Mrs. O. | 27 yrs. | Mar. 8, 1920 | 112 | +33 | |
| | | Mar. 10, 1920 | | | Excision of adenoma |
| | | Mar. 19, 1920 | 70 | +11 | |
| | | May 17, 1920 | 68 | +4 | |
| Mrs. Z. | 58 yrs. | May 11, 1920 | 110 | +39 | |
| | | May 12, 1920 | | | Excision of adenoma |
| | | May 21, 1920 | 86 | —3 | |

Metabolism estimation correlated with the clinical examination is also of marked value in indicating the ability of a patient to withstand surgical procedures of various magnitudes; for example, in deciding whether the ligation of a single thyroid pole should be employed, whether it would be wise to ligate both thyroid poles, or whether it would be safe to employ partial thyroidectomy as a primary procedure. It is of further value in deciding when to follow the preliminary pole ligation with the partial thyroidectomy. Up to recently it has been our custom to ligate the superior thyroid poles and then send the patient home for eight weeks, at the end of which time the patient returned to the hospital for the complete operation. As the result of our metabolism investigations, we have been finding that in some cases by waiting eight weeks, we have passed the period of maximum improvement, as indicated by a rise in the metabolism rate from the rate representing the maximum drop after pole ligation. We have, therefore, come to the conclusion that during the intervals between pole ligation and partial thyroidectomy, metabolism estimations should be made every two weeks, and partial thyroidectomy employed as soon as the maximum gain indicated by a drop in metabolism and pulse rate is made.

Since we do not feel that metabolism rate alone in hyperthyroidism is a true criterion of the seriousness of a patient's condition, and, considered alone, is unreliable as a guide to the extent of the surgical procedure to be employed, it is at once evident that it is impossible to make any fixed statement concerning the percentage figures in basal metabolism at which it is safe to perform partial thyroidectomy as a primary procedure. Neither is it possible to state at what level of basal metabolic rate it is wise to ligate but one pole, nor is it further possible from basal metabolism estimations alone to weed out the cases too seriously afflicted to be submitted to any surgical procedure, and to be relegated to the less satisfactory and more prolonged methods of treatment not surgical in nature, such as rest and x-ray treatment.

Yet with the previous view clear in our minds, we are willing to make certain approximate groups which we believe, from our experience, work out satisfactorily in a majority of instances.

Partial thyroidectomy may be employed as a primary measure, unpreceded by ligations, in most of the cases showing increases in metabolic rates of not over +35. In all such cases, however, careful consideration must be given to the apparent degree of toxicity of the disease, as evidenced by the clinical signs, and this consideration must not be biased by the degree of increase in basal metabolic rate, however moderate it may be. Careful consideration must also be given resulting or associated lesions, such as myocarditis and renal lesions.

Fine judgment, based largely upon an extensive experience as to how similar cases have acted under various surgical procedures, is necessary in deciding between pole ligation and primary partial thyroidectomy in the cases of hyperthyroidism showing increases in basal metabolic rates of between +35 and +50. Decision as to the type of operation should be left until the patient is on the operating table and anaesthetized, and should then be made only when based upon the known basal metabolic rate, the pulse rate, its character and rhythm, and with a consideration of the possible degree of post-operative thyroid reaction. It is our custom to make this decision with the coöperation of our anesthetist, Dr. Lincoln F. Sise, who in 500 operated thyroid cases has had the same opportunity as we have had to observe their condition before, during, and after various surgical procedures. We have but one fixed rule in deciding as to the wisdom of primary partial thyroidectomy. When doubt exists even in the slightest degree as to the safety of primary partial thyroidectomy, we ligate. We do not permit ourselves to be influenced by the possible disappointment of the patient or her friends in that a second and possibly a third and a fourth operation may be needed before permanent relief is accomplished. We are unbiased by the consideration that the patient may never return for the final operation. Once or twice we have been biased by the fact that a patient had came from a long distance, such as the Middle-West or the provinces of Canada, and was anxious to be saved the cost and discomfort of either a trip home and return within two months, or a stay of perhaps two months away from her home. Twice have we permitted these considerations to sway us in favor of primary partial thyroidectomy. In both instances severe reactions occurred from which the patients, to our relief, recovered; but no longer are we influenced in the least by any of the foregoing considerations. Where life lies in the balance, judgment as to the procedure, in our opinion, must be based entirely upon facts which have to do only with the limiting of risk to the individual.

Most patients showing basal metabolic rates above +50 are safest when submitted to primary ligation of one or both of the superior thyroid poles. It is our custom in these cases to reserve decision, as previously stated, until the patient is anaesthetized (scopolamine, morphia, novocaine + gas oxygen), making use of the same measures as stated above. The decision is then made whether the patient shall be sent back to bed to observe the degree of reaction to the anaesthesia and visit to the operating room, or whether ligation of the poles shall be proceeded with. If the latter procedure is decided upon, one superior pole is rapidly ligated and decision as to whether ligation of the other superior pole is to be carried out is based upon the immediate condition of the patient and how she has endured the ligation of a single pole.

In patients showing metabolic rates of from +75 up, extreme caution must be exercised in the extent of the surgical treatment made use of. In the doubtful cases, a visit to the operating room and gas oxygen anaesthesia with no operative procedure gives valuable evidence as to the resulting degree of reaction. In the less doubtful cases, the ligation of a single pole with a wait of ten days to two weeks makes the ligation of the second pole very much more safe for the individual (Chart V).

CHART V.

SHOWING PROGRESSIVE DROP AS RESULT OF A SINGLE POLE LIGATION.

| NAME | AGE | DATE | PULSE RATE | BAS. MET. RATE | OPERATION |
|---|---|---|---|---|---|
| Mrs. F. | 53 yrs. | Jan. 24, 1920 | 130 | +99 | |
| | | Jan. 29, 1920 | | | Double sup. pole ligation |
| | | Mar. 31, 1920 | 120 | +74 | |
| | | Apr. 1, 1920 | | | Single inf. pole ligation. |
| | | Apr. 14, 1920 | 104 | +36 | |
| | | Apr. 15, 1920 | | | Partial thyroidectomy |
| | | Apr. 25, 1920 | 106 | +4 | |
| Miss D. | 20 yrs. | May 27, 1920 | 146 | +60 | |
| | | May 28, 1920 | | | Single sup. pole ligation. |
| | | June 3, 1920 | 136 | +38 | |
| | | June 4, 1920 | | | Sec. single sup. pole ligation |
| | | July 29, 1920 | 134 | +45 | |
| | | July 30, 1920 | | | Partial thyroidectomy |
| | | Aug. 25, 1920 | 112 | +29 | |

In case (Miss D.), note increase in metabolic rate between observations of June 12th and July 29th from +10 to +45, a possible example of a delay beyond the optimum point following ligation.

### CHART VI.

### CHART SHOWING METABOLIC RATE DURING COURSE OF SURGICAL TREATMENT IN TEN CASES OF PRIMARY HYPERTHYROIDISM.

| NAME | AGE YRS. | DATE | PULSE RATE | BODY WEIGHT LBS. | BAS. MET. RATE | OPERATION |
|---|---|---|---|---|---|---|
| Mrs. A. | 34 | May 14, 1920 | 106 | 123.2 | +55 | |
| | | June 22, 1920 | 114 | 116.6 | +61 | |
| | | June 23, 1920 | | | | Double sup. pole ligation |
| | | June 28, 1920 | 106 | 112.2 | +57 | |
| | | Aug. 3, 1920 | 104 | 116.9 | +21 | |
| | | Aug. 11, 1920 | | | | Partial thyroidectomy |
| | | Aug. 19, 1920 | 74 | 114.7 | +1 | |
| Mrs. A. | 53 | Dec. 15, 1919 | 128 | 98 | +77 | |
| | | Dec. 16, 1919 | | | | Double sup. pole ligation |
| | | Mar. 18, 1920 | 122 | 90.5 | +58 | |
| | | Mar. 19, 1920 | | | | Partial thyroidectomy |
| | | Mar. 28, 1920 | 92 | 87.5 | +19 | |
| Mr. A. | 23 | Apr. 15, 1920 | 120 | 117.2 | +81 | |
| | | Apr. 16, 1920 | | | | Double sup. pole ligation |
| | | June 16, 1920 | 108 | 120.2 | +60 | |
| | | June 18, 1920 | | | | Partial thyroidectomy |
| | | June 25, 1920 | 80 | 113.9 | +34 | |
| | | Sept. 4, 1920 | 54 | 132.9 | —16 | |
| Miss B. | 25 | May 19, 1920 | 118 | 109.7 | +62 | |
| | | May 20, 1920 | | | | Double sup. pole ligation |
| | | May 27, 1920 | 112 | 104.6 | +30 | |
| | | July 14, 1920 | 104 | 103.3 | +34 | |
| | | July 15, 1920 | | | | Partial thyroidectomy |
| | | July 24, 1920 | 94 | 97.6 | +8 | |
| Miss D. | 28 | Jan. 8, 1920 | 120 | 125.1 | +93 | |
| | | Jan. 9, 1920 | | | | Double sup. pole ligation |
| | | Jan. 15, 1920 | 106 | 119 | +68 | |
| | | Mar. 9, 1920 | 98 | 125 | +58 | |
| | | Mar. 10, 1920 | | | | Partial thyroidectomy |
| | | Mar. 21, 1920 | 74 | 128 | +15 | |
| | | July 15, 1920 | 74 | 140.2 | +17 | |
| Mrs. F. | 28 | Oct. 15, 1919 | 130 | 119.5 | +63 | |
| | | Oct. 26, 1919 | | | | Double sup. pole ligation |
| | | Nov. 2, 1919 | 124 | 110.7 | +72 | |
| | | Jan. 22, 1920 | 116 | 111.2 | +55 | |
| | | Jan. 23, 1920 | | | | Partial thyroidectomy |
| | | Feb. 1, 1920 | 86 | 102.7 | +24 | |
| Mrs. H. | 58 | Feb. 4, 1920 | 90 | 145 | +37 | |
| | | Feb. 5, 1920 | | | | Double sup. pole ligation |
| | | Feb. 20, 1920 | 94 | 137 | +27 | |
| | | Apr. 10, 1920 | 82 | 146.6 | +11 | |
| | | Apr. 11, 1920 | | | | Partial thyroidectomy |
| | | Apr. 24, 1920 | 76 | 140 | —5 | |
| Miss H. | 44 | Dec. 11, 1919 | 124 | 103 | +70 | |
| | | Jan. 3, 1920 | | | | Double sup. pole ligation |
| | | Jan. 11, 1920 | 120 | 93.7 | +82 | |
| | | Mar. 2, 1920 | 98 | 113.7 | +21 | |
| | | Mar. 3, 1920 | | | | Partial thyroidectomy |
| | | Mar. 14, 1920 | 116 | 100.7 | +30 | |
| | | July 9, 1920 | 94 | 108.5 | +23 | |
| Miss P. | 22 | Dec. 29, 1919 | 130 | 84.3 | +72 | |
| | | Dec. 30, 1919 | | | | Double sup. pole ligation |
| | | Jan. 12, 1920 | 96 | 77.2 | +100* | |
| | | Mar. 5, 1920 | 106 | 91.5 | +23 | |
| | | Mar. 6, 1920 | | | | Partial thyroidectomy |
| | | Mar. 15, 1920 | 96 | 81.5 | +29 | |
| | | Apr. 30, 1920 | 84 | 96.2 | —5 | |
| Mrs. S. | 44 | July 2, 1920 | | | | Double sup. pole ligation |
| | | July 10, 1920 | 120 | 120.2 | +79 | |
| | | Aug. 11, 1920 | 106 | 134 | +51 | |
| | | Aug. 27, 1920 | 114 | 137.5 | +53 | |
| | | Aug. 28 1920 | | | | Partial thyroidectomy |
| | | Sept. 3, 1920 | 94 | 129.7 | Normal | |

NOTE.—It is to be noted that in some cases the immediate effect of ligation is a temporary rise in the metabolic rate.

* Fever

It is our opinion that there is hardly a surgical disease in which caution is as necessary as in the cases of marked thyrotoxicosis. As they approach the higher levels of toxicity as indicated by clinical signs and increases in metabolic rates to high level, each case should be individualized and no longer looked upon as being a member of a group. After such cases have reached the more intense stages of thyroid intoxication, they no longer conduct themselves by rule. This statement is more or less true of hyperthyroidism as a whole, but is particularly characteristic of the intensely toxic cases. After an extensive experience with thyroid cases, we feel able to prophesy with relative certainty the course and reaction of mild and moderate degrees of thyroid intoxication to various surgical procedures, but have by no means the same degree of assurance regarding the intensely toxic cases. It is because of this unknown capacity for unfavorable reaction on the part of severely toxic cases that extremely cautious advance should be made. First, the degree of reaction to the slight discomfort and apprehension which goes with the estimation of basal metabolism, next the reaction to a visit to the operating room and short gas oxygen anaesthesia, and finally based upon this data, the ligation of a single thyroid pole. Having advanced so far, we have accumulated sufficient data upon which to base with reasonable certainty a decision as to the probable outcome with further surgical procedures.

We feel that there will be a tendency to accept basal metabolic rates as true percentage estimates of thyroid hyperfunction, which in turn afford a basis for a true prediction of reactions to surgical procedures; and we must emphasize our conviction that such a condition of affairs would be extremely dangerous. With the first view, however, we feel some sympathy. That thyroid toxicity, if we may for practical purposes consider the disease in terms of toxic thyroid products, is represented by increased basal metabolic rates there can be little question. One has but to observe the charts shown here, and note the metabolic rate before operation,—the progressive drop in the metabolic rate and pulse rate after ligation and again after partial thyroidectomy, together with the progressive clinical improvement in the patient, going hand in hand in most instances with the drop in metabolic rate,—to be convinced that metabolic rate quite accurately represents degree of toxicity (Chart VI).

Cases have arisen, however, in which there has been marked clinical improvement and gain in weight without proportionate drop in metabolism (Chart VII).

CHART VII.

SHOWING TWO CASES IN WHICH, AFTER LIGATION, CLINICAL IMPROVEMENT AND GAIN IN WEIGHT OCCURRED WITHOUT PROPORTIGNATE DROP IN METABOLISM.

| NAME | AGE YRS. | DATE | PULSE RATE | BODY WT. LBS. | BAS. MET. RATE | OPERATION |
|---|---|---|---|---|---|---|
| Mrs. C. | 40 | Mar. 6, 1920 | 116 | 107.5 | +45 | |
| | | Mar. 10, 1920 | | | | Sup. pole ligation |
| | | Mar. 16, 1920 | 108 | 104.2 | +53 | |
| | | May 8, 1920 | 102 | 115.1 | +52 | |
| | | May 9, 1920 | | | | Partial thyroidectomy |
| | | May 19, 1920 | 91 | 108.5 | +37 | |
| | | July 17, 1920 | 72 | 120.7 | +15 | |
| Miss M. | 35 | Apr. 23, 1920 | | | | Single sup. pole ligation |
| | | May 6, 1920 | 130 | 109.7 | +48 | |
| | | May 7, 1920 | | | | Second sup. pole ligation |
| | | May 12, 1920 | 124 | 109.6 | +31 | |
| | | July 6, 1920 | 118 | 118.5 | +46 | |
| | | July 7, 1920 | | | | Partial thyroidectomy |
| | | July 17, 1920 | 96 | 115.7 | +14 | |

Regarding the second view—that basal metabolism represents true terms of toxicity which in turn may be used to estimate ability to withstand surgical procedures, we feel very strongly that the level of basal metabolic rate alone is quite undependable, and in fact often misleading as a means of prognosticating the seriousness of the patient's state and her ability to endure any surgical procedure. We have had surgical experiences with patients showing metabolic rates at both extremes, in which the course and results of the operative procedure have been entirely out of accord with what might have been expected from the metabolic rate.

We have, for example, operated upon patients with a basal metabolic rate of +26 with a hyperthyroidism of long standing, and seen an extremely well-marked operative and post-operative reaction. On the other hand, we have operated upon patients with metabolic rates around +60 or over, but with a hyperthyroidism of short duration, who have shown much less operative and post-operative reaction than have the patients with a rate of +26 as spoken of above.

It is our feeling that one must consider—in estimating the operative risk—not only the degree of toxicity, but also the cardiac reserve as estimated by the rate, rhythm, and character of the pulse wave, by the length of time the disease has been present, and by the history and signs of past or present indications of unsettled compensation, and the destructive effect of the disease on other structures, as indicated by varying degrees of nervousness, tremor, and loss of weight.

Errors of estimation and the avoidance of their causes have been discussed in the first portion of this paper. Given an accurate estimation carefully checked against those influences (principally food and exertion) which in themselves produce increased rates, errors then occur for practical purposes but rarely in the interpretation of these findings. Care must be taken, for example, in thyroid cases, to ascertain the presence of complicating conditions which seriously affect the metabolic rate. For example, diabetes, in our experience, has not been a rare complication of hyperthyroidism (or *vice versa*, if you choose), and in such a condition care must be taken to ascertain to what diet and to what treatment the patient has been subjected.

Care must also be taken to ascertain possible renal lesions, marked examples of which are said to give increased metabolic rates.

Seemingly simple infections giving but low degrees of temperature reaction must also be eliminated, as fever very promptly results in a marked increase in metabolic rate.

In thyroid cases, basal metabolism estimation should not be undertaken at a time too close to the period following the performance of the Goetsch or epinephrin test, as injections of epinephrin have resulted, in our experience, in well-marked rises in metabolic rates (Chart VIII).

Apprehension, anxiety, and excitation play a considerable part in the production of unreliable data in metabolism estimation, and where even the possibility of such influence occurs, the test should be repeated daily until an average is struck or the patient eliminated as a subject from whom a reliable result may not be obtained.

CHART VIII.

SHOWING EFFECT UPON BASAL METABOLISM RATE OF INJECTION OF 8 MINIMS OF EPINEPHRIN (1-1000 SOL.).

Mr. H., Age 53 Yrs.

| | BAS. MET. RATE | PULSE RATE | BLOOD PRESS. |
|---|---|---|---|
| Before injection | +76 | 102 | 130/88 |
| MINUTES AFTER INJECTION | | | |
| 5 | +77 | 108 | 132/90 |
| 11 | | 112 | 148/88 |
| 15 | | 107 | 142/94 |
| 20 | | 120 | 166/86 |
| 25 | | 120 | 168/86 |
| 30 | +89 | 119 | 176/102 |
| 35 | | 120 | 160/90 |
| 40 | | 124 | 146/96 |
| 47 | | 124 | 138/91 |
| 55 | | 124 | 134/96 |
| 60 | +78 | 121 | 134/96 |
| 65 | | 116 | 134/94 |
| 70 | | 116 | 132/92 |

CHART IX.

SHOWING AVERAGE RATE OF BASAL METABOLISM IN SECONDARY AND IN PRIMARY HYPERTHYROIDISM.

| | |
|---|---|
| *Adenoma with secondary hyperthyroidism* (25 cases) | |
| Before excision of adenoma ...... | +40.44 |
| After excision of adenoma (av. 9.5 days) ...................... | +22.61 |
| *Primary hyperthyroidism* (25 cases). Preliminary ligation of poles | |
| Before ligation .................. | +62.00 |
| After ligation (av. 7.5 days) .... | +52.19 |
| Before partial thyroidectomy (av. 61 days after ligation) ........ | +43.84 |
| After partial thyroidectomy (av. 9.1 days) ...................... | +19.47 |

Out-patients presenting themselves for estimation upon the morning of the test may or may not have observed the essential necessity of having abstained from nourishment or stimulants for fourteen hours previous to the test, so that for accurate results it should be insisted that the patient spend the night before the test in the hospital.

Associated lesions of the pituitary, wasting disease, prolonged dieting, particularly for diabetes, are thought to be some of the possible causes of abnormally low readings.

When all the above-mentioned factors can be eliminated and the basal metabolic rate can be regarded as a true index of thyroid activity, it may be said in conclusion, that, in our opinion in a clinic for diseases of the thyroid, a test of the rate of basal metabolism is an invaluable factor in the data necessary for diagnosis; secondly, that it aids greatly in prognosis; thirdly, that it probably has its greatest value as an index of the results of treatment in any given case.

## Medical Progress

## REPORT ON RECENT PROGRESS IN DERMATOLOGY.

By John T. Bowen, M.D., Boston.

### POST-VACCINAL RINGWORM (TRICHOPHYTOSIS?)

Gougerot[1] states that the examination of thousands who were vaccinated during the war has shown that ringworm, although rare, was the most frequent complication of vaccination. and the most important in practice. Other complications were impetigo and erythema, very rarely septic or other affections. The subjects were of all ages, soldiers, children, workers in powder factories, and the affection usually began at the end of the vaccinal process when the crust was about to fall, from the fifteenth to the twentieth day. The development was usually slow, in one case, a year; sometimes, however, rapid, one patient having, eight weeks after the vaccination, the arm almost entirely covered and the chest spotted with foci of auto-inoculation. There is nothing peculiar about the clinical aspects, the forms varying according to the variety of the species inoculated. The process seems to go on indefinitely if not treated. Gougerot declares that negative bacteriological results should not deter one from a clear clinical diagnosis. The treatment, the same as that of trichophytosis of the smooth skin, although simple, is entered into with much elaboration and detail by the writer.

Etiologically, it is to be supposed that the vaccine was uncontaminated and that the skin abrasion offered the gate of entrance to the fungus contained in the clothing or existing on the skin of certain persons. In other instances, family or atelier epidemics seem to prove a contamination of the virus.

With regard to prophylaxis, it seems that contamination of the vaccine could be eliminated by careful examination of the skin of the heifers before inoculation, both clinically and microscopically. Gougerot thinks the subject of importance in that these complications are very often misinterpreted. He disclaims any desire to criticise the excellent French vaccination plants, or to raise this slight complication as an argument against vaccination.

### THE PARASITIC NATURE OF DYSIDROSIS.[2]

Of late the impression has been steadily gaining ground that at least many of the cases described under the heading of dysidrosis, by Tilbury Fox, and of pompholix by Hutchinson, are really a form of epidermophytosis of the extremities. Darier noticed during the war that whenever a soldier appeared with a vesiculo-bullous or squamous eruption limited to the hands and feet, three diagnoses were usually considered,—eczema, occupational dermatitis, or dysidrosis—only exceptionally was a parasitic mycotic affection thought of. Diathetic and seborrhoeic eczema are seldom, if ever, localized on the hands and feet; whereas the professional or artificial forms of dermatitis have their seat on the hands, less often on the feet, and are recognized by the character of the initial lesions and by inquiry about the occupation. Tilbury Fox's dysidrosis and Hutchinson's cheiro-pompholix, or simple pompholix, is a vesiculo-bullous dermatitis, later on squamous in type, essentially limited to the hands and feet, and comes on in recurring attacks, especially in spring and summer; is symmetrical, is accompanied by burning or tingling, and often appears after profuse perspiration, a nervous shock, or violent exercise, and is said to be most common in overworked, dyspeptic, neurasthenic subjects.

It has been found in the last fifteen years that various epidermycoses can produce quite the same appearance as dysidrosis and eczema of the extremities. A palmar and plantar trichophytosis was first described in 1892 by Djelaleddin Mouktar, and differentiated from dysidrosis. Then came the work of Sabouraud from 1907-1910 on epidermophytosis, an affection due to a parasite closely allied to the trichophyton, the epidermophyton inguinale, which does not attack the hairs. When situated in the groin and on the upper part of the thighs, it causes the form known as Hebra's eczema marginatum, showing very red, round or polycyclic patches, rapidly extending, with sharply bounded edges, and sometimes vesicular. Occasionally this form is seen in the armpits, and other parts of the trunk. It is very common in the interdigital space between the toes, showing a macerated epidermis, covering a red base and sometimes accompanied by vesicles. It may reach the instep, and may continue indefinitely. On the hands it is rarer, exhibiting irregular vesicles on the lateral surfaces of the fingers, without forming circles, and can be surely identified only by a microscopical examination which shows in the scales and vesicles the characteristic mycelium. Sabouraud pointed out that the etiological conditions to which dysidrosis is attributed were very common, whereas numerous cases of this form were not recorded. He found among soldiers attacked by vesiculo-bullous or squamous eruptions on the hands and feet: (1) A huge majority of secondary eczema from scabies, pediculosis, boils, wounds, etc. (2) A considerable number of cases of occupational dermatitis. (3) A very few cases of palmar trichophytosis. (4) A moderate number of cases which best fitted in the category of dysidrosis. The types of these were: (a) Vesicular and bullous type: clear vesicles scattered or vaguely grouped on the palmar and lateral surfaces of the fingers, on the palm, and sometimes on the back of the hands; lenticular and bullous lesions, often purulent, on the forepart or whole sole of the foot. (b) Vesiculo-squamous type, in which the lesions were made up of erythemato-squamous blotches, scattered or confluent, with crumbling edges. (c) Squamous type, dry desquamations, irregular with wavy edges, only exceptionally circinate or polycyclic. This is complicated constantly with intertrigo of the toes.

In order to determine how many of these cases are epidermic mycoses, Darier examined the roofs of the vesicles and the scales microscopically. He found the epidermophyton in such a large proportion of the lesions examined that he is forced to the conclusion that dysidrosis does not exist as a distinct cutaneous disease, and that the clinical picture so well portrayed by Fox and Hutchinson is that of epidermophytosis of the extremities. His method was to treat the shreds of epidermis with alcohol-ether to remove the fat, then separate by needles in acetic acid, and finally clear on the slide in 40% caustic potash with gentle heat. He admits, however, that it will be necessary for further investigations to confirm this conclusion and to determine the exact nature of the parasite and whether one or several species are concerned. Furthermore, the clinical facts support the view that dysidrosis is a mycotic disease, inasmuch as it is said that the attacks of dysidrosis usually last from ten to twenty days and often recur in the same subject, and that this is true of epidermophytosis of the extremities; but it must be added that one also sees continuous attacks prolonged for six months. The two affections are much alike, also, in topographical distribution: attacking hands, feet, or all four extremities symmetrically at the same time.

### EXFOLIATIVE DERMATITIS DUE TO ARSPHENAMINE.

Latham,[3] at Columbia, S. C., reports that there had occurred during the preceding five months four cases of this affection of which he describes the most typical—a fatal one which followed the intravenous injection of 0.8 gm. of arsphenamine. A man of 27 had a positive Wassermann, but exhibited no signs or symptoms of syphilis and denied a venereal history. He received an injection of 0.4 gm. of arsphenamine intravenously, and a second dose of the same amount one week later. Ten days after the second dose he was admitted to the medical ward of the base hospital with an intense erythema and beginning infiltration of the skin of the face and neck, with superficial desquamation and pigmentation, together with some conjunctivitis. At this time there was no evidence of polyneuritis. Arsenic was found in the urine, but apparently had excited no renal irritation. The erythema and exfoliation gradually became generalized and a moderate fever appeared. There was some fissuring and exudation. Four weeks after the first dose of arsphenamine, the only constitutional symptoms were a moderate fever and a pronounced leucocytosis. As the exfoliation progressed, toxic symptoms appeared, the pulse and fever rose, and a laryngobronchial catarrh asserted itself. Mental symptoms appeared coincidently with some sensory disturbance and stupor; coma and light convulsions were present. There was increasing soreness of the mouth, so that toward the end he had to be fed by a tube. There was evidence of severe trophic disturbance of the blood vessels causing extraversation of the blood from the slightest wound. Thirty-four days after the first dose of arsphenamine, he was in a state of coma, with a definite bronchopneumonia. He died on the thirty-eighth day.

The urine showed traces of arsenic as late as the thirty-fourth day, as did also that remaining in the bladder after death. Towards the end there was evidence of renal irritation. Experimentation has shown that after such a small dose of arsphenamine, arsenic does not usually appear for so long, or so consistently. The slight renal irritation that appeared just before the end cannot be ascribed to arsenic, but rather to the impairment of the skin function. It was only after large quantities of the scales had been tested that arsenic was discovered in them. There was a high polymorphonuclear leucocytosis, persisting up to within a day before death. There was a marked eosinophilia, as high as 40%, and the eosin cells were most numerous at a time when there was a slight improvement in the patient's condition, the percentage sinking to zero during the last three days of life.

The autopsy showed extensive passive congestion and an area of broncho-pneumonia at the right base. Heart and liver soft and pulpy, in many places fatty degenerated. Kidneys somewhat congested, but there was no definite nephritis. There was an adherent mucous on the mucosa of the stomach and intestines, which showed chemically the presence of arsenic, as did the liver, brain, skin, and the pericardial fluid.

In his summary, the writer emphasizes the fact that diarrhea and vomiting were absent during all stages of the intoxication, that nephritis was not marked at any time and appeared only at the end; that there was a decided affinity of the poison for the skin and for the trophic nerves supplying it; that arsenic was persistently present in the urine, without accompanying renal irritation, and was found at the autopsy in every tissue in which it was sought for; and that there was a high leucosytosis and eosinophilia, the latter corresponding closely to the patient's condition.

## MORBID PHENOMENA FOLLOWING ARSPHENAMINE AND NEOARSPHENAMINE.

Beeson[1] reports a case of polyneuritis plus dermatitis exfoliativa following neoarsphenamine, an association the rarity of which is shown by a review of the literature. It was first mentioned by Duhot in 1912, who reported that in patients treated with large doses of neo-arsphenamine, repeated every two or three days until four or five injections had been given, there appeared first, formication and pain in the soles and calves, edema of the legs and feet, and a reddening and furfuraceous scaling of the skin, followed in the more serious cases by successive disappearance of the plantar, Achilles, and patellar reflexes, together with loss of muscular power in the legs, and paralysis. There were similar symptoms in the arms. These cases were believed to be due to chronic arsenical intoxication. There were no cerebral complications, or disturbances of sight or hearing. Spillman has reported one similar case.

Beeson refers to the fatal cases of dermatitis exfoliativa after arsphenamine treatment recently reported by Latham and Carr and to a personal communication of an analogous case from Fordyce, Ormsby and Morrow, and remarks that it appears that exfoliative dermatitis has been observed by a large number of those who have had a wide experience with this treatment. Brooks and Roberts have described symptoms from an epidemic of arsenical beer poisoning in England in 1901, that correspond closely to those following arsphenamine and neo-arsphenamine poisoning, namely exfoliation of the skin, pigmentation, hyperkeratoses, pemphigoid eruption and herpes, and others have emphasized the nervous phenomena exhibited in this epidemic.

Beeson cites a number of other cases of polyneuritis following arsphenamine and neo-arsphenamine, and then proceeds to collate the various reported cases of peripheral nerve involvement due to syphilis and mercury. Of the former there are numerous instances, and a few well-recorded cases of the latter.

Beeson's own case is that of a negro of 42, who had a positive Wassermann, although there was no other evidence of syphilis. He had six weekly intravenous injections of neo-arsphenamine given in concentrated solution, and a dozen intramuscular injections of 1 per cent. solution of mercuric chloride. A second course was begun after three weeks, and two more injections of the neo-arsphenamine given, when he was taken suddenly ill and soon developed a tense and dangerous exfoliative dermatitis, attended with emaciation and delirium. Two months later, nerve symptoms appeared, and he soon developed a polyneuritis. Despite his serious condition and symptoms of marked toxemia, such as a high fever lasting almost three months, he eventually recovered. The treatment was symptomatic.

It is considered that there is no reason to doubt that neo-arsphenamine was the causative factor, on account of its arsenical properties, and a cumulative effect is to be supposed. Beeson considers that syphilis and alcohol were contributing causes. He considers it improbable that mercury was a factor, since in that case we should expect stomatitis, more marked gastro-intestinal symptoms, and probably neuritis; also most cases of intoxication after mercurial injections come after the use of insoluble salts, such as calomel and gray oil.

### ETIOLOGY OF ALOPECIA AREATA.[5]

Sabouraud, after more than twenty years' study of this mysterious affection, agrees with Brocq in the strength of the arguments in favor of local parasitism as the cause of the circinate form of alopecia areata and of its spreading out from a center. This view is supported by the fact that the area appears suddenly by the spontaneous falling of forty to fifty hairs, and increases progressively by the falling of hairs in the periphery. Among the hairs that fall are noticed the club-shaped or exclamation-point hairs, which have been described by Sabouraud as "cheveux peladiques," and which he regards as absolutely characteristic of plaques that are in process of extension; as when a primary plaque is checked in its course, one often sees groups of exclamation-point hairs at the periphery which are the forerunners of a new point of extension. Oftentimes, also, the areas may increase in one diameter while they fill in in another with new hairs, so that the area will end by healing at a very different point from that from which it started. Sometimes a single area may constitute the whole affection; it heals and everything disappears. At other times, however, perhaps six weeks after the appearance of the primary area, a series of similar patches may appear, similar to the original in all respects. Later on, after a period which might be called incubation, the plaques multiply still more. All this is similar to what happens in trichophytosis. Another point observed recently by Sabouraud is that after a primary plaque has been followed by a period of apparent repose, one often sees several secondary plaques appear, which are in turn followed, after several weeks more, by a multitude of new and very small plaques each of which, before becoming bald, is signalized by an erythematous spot of orange red, of the same dimensions as the succeeding area. This erythema is very transient, and is a rare occurrence.

In Sabouraud's opinion, the patch of alopecia areata, with its fringe of classic hairs, is a morbid type of special, peculiar characteristics. The only other condition that can be compared to it is that produced by the local action of the x-rays.

Another type of alopecia areata is that called ophiasis, which usually begins at the lower part of the occiput, extending upward, usually by way of the borders. Sabouraud considers that the two types differ only by symptoms which are not always present, while the essential symptoms are the same in the two types. In neither type is there the slightest proof of contagiousness, in Sabouraud's view.

The writer is not disposed to regard the evidence in favor of the trophoneurotic origin of alopecia areata as convincing, and combats one by one the various arguments that have been adduced.

As to the theory of the dental origin of alopecia areata, introduced by Jacquet, Sabouraud considers that a relationship between the teeth and this affection has not been shown. But in examining the teeth of his patients, he has been struck wit hthe frequency of multiple affections of the bones, such as deformities of the cranium, changes in the maxillary bones, etc. He points out that syphilis is considered to be the principal cause of these defects, although he does not claim that syphilis, either late or hereditary, is the sole cause of alopecia areata. Sabouraud considers it more important to treat the healthy portions of the scalp than the diseased. If the whole scalp is treated, the alopecia may, in many cases, be limited. Treatment of the whole head with oil of cade has given excellent results. Topically, he considers chrysophanic acid diluted 1-100 in chloroform the most active remedy.

### CREEPING DISEASE.[6]

Darier has observed, and described with his usual painstaking accuracy, a case of creeping disease (larva migrans), an affection rarely seen in France, although zoölogists report that species of the organisms which cause it are common all over Europe and in Northern Africa. The clinical aspects of the form named creeping eruption by Robert Lee in 1874, are quite characteristic. The case reported was at once recognized by all the assistants.

The patient was a man of thirty-nine, employed on the railroad in Paris. It was pretty conclusively shown that he must have contracted this parasitic affection in Paris. The lesion was situated on the back of the left hand, extending from the wrist to the lower part of the little finger, and took the form of a red and elevated streak, quite sinuous, and of an oedematous rather than indurated consistency. It had begun five days previously by intense pruritus. The parasite was extirpated by incising freely the tissues which contained it. It was found microscopically to be situated immediately under the epidermis of the finger, surrounded by a chitinous membrane armed with hooks, provided with a digestive tube, and muscular fibres in its body. There was a total absence of inflammatory reaction of the skin. The canal dug in the skin by the parasite by means, no doubt, of its hooks, was entirely filled by it and was nowhere below the skin, but immediately beneath the epidermis, in the papillary layer. It was thought that the larva might be that of the Hypoderma bovis of Geer, with which the patient may have come in contact through his employment at the Gare Montparnasse. Similar cases have been observed in the Shetland Islands, Norway, Brittany, Brazil, etc. Nowadays three forms of cutaneous and subcutaneous myiasis are recognized clinically: (1) Creeping disease, or myiasis rampante, characterized by a red sinuous line, raised and progressive, which advances from one to four centimeters per day, of which the above case is an example. (2) Subcutaneous myiasis, *à tumeurs ambulatoires,* in which oedematous or inflammatory tumors are produced during several weeks or months, which may attain the size of an egg, and the last one of which gives issue to the larva. The tumors are due to the subcutaneous migration of a larva which causes sharp pain. (3) Furuncular myiasis, in which there are no intradermic or subcutaneous migrations of the larva; a single inflammatory tumor is the first and last morbid manifestation, the parasite itself finishing by leaving the tumor, if it is not extracted. It is remarkable that each of these three clinical forms is not due to a different parasitic species, as larvae of diverse species have been found in each of these classes.

REFERENCES.

[1] Paris Médical, June 7, 1919.
[2] The Lancet, French Supplement, Sept. 27, 1919.
[3] Jour. A. M. A., July 5, 1919.
[4] Archives of Derm. and Syph., September, 1920.
[5] Annales de Derm. et de Syph., vi serie, tome 1, No.4
[6] Annales de Derm. et de Syph., vi serie, tome 1, No. 3.

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## Book Review.

*Tropical Ophthalmology.* By Robert Henry Elliot, M.D., B.S., F.R.C.S., London: University Press, 1920.

No one who takes up this book will want to put it down until it is finished. It is attractive in style and undertakes a new subject. The scenes and conditions which have been familiar to Colonel Elliot awaken in us the liveliest curiosity, and his description of the natives in India and their environment, as far as it relates to this subject, is fascinating. A humane and conscientious surgeon, he dwells on the human side of his work and leaves a striking picture of medical work in the tropics. After discussing the mental and physical characteristics of the natives and the conditions which cause or favor ophthalmic disease, he depicts the peculiarities of these diseases as found in the tropics, giving special attention to injuries inflicted on the eyes by animals and parasitic diseases. These chapters are a mine of information. The chapters on operative work, especially cataract, and the work of the native coucher, will attract attention. The last section, dealing with general disease as affecting the eyes, gives the author a chance to express valuable views on some subjects we know little about in this climate, and his remarks on malaria as a cause of corneal condition are instructive. The book is well illustrated in black and white and has seven fine colored plates. We advise every ophthalmologist to read this book, not only for instruction, but also for pleasure.

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Yale Medical School.—Dr. Yandell Henderson, hitherto professor of physiology in the Yale Medical School, has been transferred to the Graduate School of Yale University, under the title of Professor of Applied Physiology.

The tuition fee in the Medical School, beginning with the next university year, has been increased from $240 to $300, and announcement is made that, beginning with a year from next fall, three years of collegiate work or its equivalent, instead of the present two years, shall be required for all candidates for admission to the School of Medicine.

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## ENCEPHALITIS WITH EXCITATION

Our attention has been called to the peculiar form of encephalitis, reported as "talking sickness," from which little eight-year-old Miriam Rubin, Waukegan, Illinois, suffers. This case has been the subject of a widely circulated newspaper story, based on half-truths, and commercialized by a widespread advertising propaganda. The newspapers have been deceived and misled. The public should know the facts ascertained by medical investigation. It is suggested that medical societies, particularly in localities in which the story has been circulated, should hold a meeting, with the object of appointing a committee to call on the local press. Where this is impossible without delay—for the action should be immediate since the story is a "live" one—the officers of the society might act, although a committee, of not less than three, would be more influential than an individual.

Undoubtedly the editors of newspapers will gladly coöperate with the local profession if the coöperation is requested in the right spirit. It would not be advisable, and nothing would be accomplished, to make the appeal in a spirit of anger or antagonism. The press should be approached realizing its viewpoint, which naturally differs from that of the medical profession, and should be asked that the following facts be given to the public:

1. That the child suffered, not from a strange "talking" sickness, but from a form of encephalitis with excitation.

2. The "incessant" talking was, in reality, intermittent, both before and after the alleged "adjustment."

3. The chiropractic "treatments" did not "cure" the disease, as claimed; they had no appreciable effect on its course.

4. The nurse's record shows that the chiropractor gave "treatments" from Februrary 12 to February 23, at which time he was dismissed, as the patient's condition gave no evidence of benefit from his "treatments." On the contrary, she was complaining of severe pain along the course of the spine. Since then, the family physician has had entire charge of the case.

5. The patient is not restored to health; on March 1, she still was seriously ill.

The medical profession is warranted in asking the press to give to the public the truth.

* * *

## LICENSING OF PRIVATE HOSPITALS.

On March 16, there was held at the State House, by the Legislative Committee on Public Health, a hearing on Senate Bill number 2501, relative to the licensing of hospitals in Greater Boston. This proposed law provides that no license shall be granted for the maintenance of a hospital, if the property owner within one hundred feet of the hospital objects. Under the definition of a hospital, this law might include every doctor's office where sick patients are cared for, and every convalescent home or sanatorium. Obviously, this situation would be productive of injustice and hardship. The private hospitals of Boston have organized to meet the emergency and will endeavor to secure an unfavorable report upon the bill. It is hoped that physicians who do not desire its passage will assist the hospitals with such influence as they may possess.

## MEDICAL NOTES.

**Wisconsin Home-Coming.**—The State Medical Society of Wisconsin will celebrate its seventy-fifth birthday by holding a "Home-Coming" meeting in Milwaukee, September 7, 8 and 9, 1921. All former Wisconsin men, whether they have practiced there or left Wisconsin to study medicine, practising elsewhere after graduating, are invited to this homecoming.

The officers of the Society are anxious to secure at this time, for mailing purposes, the names of all former Wisconsin men. They will confer a favor by sending their names and addresses to Dr. Rock Sleyster, Secretary, Wauwatoca, Wisconsin.

**Appointment of Dr. C. L. Alsberg.**—Dr. C. L. Alsberg, Chief of the Bureau of Chemistry of the United States Department of Agriculture, has been appointed Director of the Food Research Institute, which is to be established at Stanford University by the Carnegie Corporation. He will assume his new work on July 1.

### BOSTON AND MASSACHUSETTS.

**Week's Death Rate in Boston.**—During the week ending March 26, 1921, the number of deaths reported was 211 against 268 last year, with a rate of 14.53 against 17.28 last year. There were 39 deaths under one year of age against 40 last year.

The number of cases of principal reportable diseases were: Diphtheria, 67; scarlet fever, 72; measles, 93; whooping cough, 27; typhoid fever, 2; tuberculosis, 49.

Included in the above, were the following cases of non-residents: Diphtheria, 4; scarlet fever, 5; typhoid fever, 1; tuberculosis, 10.

Total deaths from these diseases were: Scarlet fever, 5; whooping cough, 2; tuberculosis, 15.

Included in the above, were the following cases of non-residents: Tuberculosis, 2.

**Exhibit of Rare Old Books on Fevers and Specific Infections at the Boston Public Library.**—During the meeting of the American Medical Association here in June, in the room used for exhibits on the floor of the Special Libraries at the Public Library, there will be spread an exhibit of early texts (Hippocrates to Sydenham) dealing with fevers and with the specific infections, arranged in chronological order. Besides the texts, there will be considerable illustrative material touching hospitalization and treatment, the use of baths, venesection, new remedies, pest banners, broadsides and medals, also Saint Roch and Saint Sebastian, and various aspects of the Plague and Syphilis dealt with in the graphic arts. General tests illustrating the Greek, Byzantine, Mohammedan and medieval practice in fevers will occupy one half of the space allotted, while the other half will contain tracts on the Plague and Syphilis, original descriptions, new diseases and primary treatises on the doctrine of *Contagium vivum*. A descriptive catalogue will be ready in time for the exhibit, which will last from June 5 to 11.

**Appointment of Dr. William A. Bryan.**—Dr. William A. Bryan has been appointed superintendent of the Worcester State Hospital. Dr. Bryan has been assistant superintendent of the Danvers State Hospital, before which he served on the staff of the Boston Psychopathic Hospital. Dr. Bryan will succeed Dr. Ernest V. Scribner.

**Retirement of Dr. Edward L. Mark.**—Dr. Edward Laurens Mark, who has been instructor and professor of zoölogy and anatomy at Harvard University for forty-four years, will retire from active teaching at the close of the present year. He has been appointed Hersey professor of anatomy emeritus.

### NEW ENGLAND NOTES.

**Observance of Dr. Storer's Birthday.**—Dr. Horatio R. Storer, dean of the medical profession of Newport, R. I., and in former years active in practice and in various scientific and health protective organizations, was honored on the occasion of his ninety-first birthday, March 20, when he was presented by representatives of citizens of Newport with a silver loving cup, in recognition of his services to the community and as an expression of the esteem in which he is held. During the day, he received many callers at his home, and many gifts and messages from friends in this city and other parts of the world. Among those whom he had with him on that day were his two sons, Dr. Malcolm Storer and Mr. John Humphrey Storer, of Boston.

During the early part of the day, Dr. Norman M. McLeod, Dr. Edward V. Murphy and Chaplain E. S. Burke of the Training Station, called at the Storer residence and, as representatives of the donors, presented the loving cup. Dr. McLeod made the presentation in a brief speech, expressing the good wishes of the donors. Dr. Storer showed his appreciation of the testimonial in a brief reply, in which he said he felt that the gift was not so much a tribute to himself as the work which he, with the donors, had been able to do for the best interests of others.

The cup, which is of beautiful design, is inscribed as follows:

Horatio Robinson Storer
the Physician
Pioneer Surgeon, Philanthropist,
Leader in Civic Administration
and the
Always Helpful Adviser,
From His Admiring Fellow
Citizens and Friends of
Newport, Rhode Island.
February 27th, 1921.

The donors included the physicians of the city, the Redwood Library, the Newport Historical Society, the Advisory Council of the Civic League, the Harvard Graduates of the city, several Roman Catholic Church organizations, and many individual friends.

## Correspondence.

### ACTION TAKEN BY THE PROFESSIONAL GUILD OF KING'S COUNTY.

New York City, March 17, 1921.

*Mr. Editor:—*

Physicians and druggists everywhere, throughout the United States, will be interested in the action of the Professional Guild of King's County in deciding to ask for an injunction restraining the New York State Narcotic Drug Commission from enforcing recent rulings of the department, compelling the use of official triplicate blanks for all prescriptions containing narcotic drugs. This course was decided upon at a meetng just held in Brooklyn, which was largely attended by the doctors, druggists and dentists, who make up the membership of the Professional Guild. At present, this ruling makes the doctors of the state, technical violators of the law, at least, as few of them have provided themselves with these blanks, believing that, under a proper construction of the Harrison Law, they are permitted to use the non-official blanks in their daily practice.

It is the general consensus of opinion that the Professional Guild is entitled to great credit for its action in this matter. Properly speaking, this course should have been taken by the organized medical bodies of the state, which, however, with one exception, have permitted this ruling to go uncontested. This is true, also, in a measure, of the state officials responsible for the acts of a subordinate official who, under the law, is empowered to make needful and helpful regulations in the conduct of this office. Needless to say, such regulations would not be universally disregarded by a class of citizens represented by the physicians and druggists of this state, if they did not endanger the safety and lives of those whom they are bound to protect, even at the risk of their own safety and welfare. This inaction cannot be excused, either, by the fact that bills are now before the Legislature abolishing the office of Narcotic Drug Commissioner.

Even if this be the case, such conduct should not be condoned indefinitely until such time as the offender is legislated out of office for reasons of economy only, when there ars many more substantial reasons for taking action upon the administration of this office at the present time.

John P. Davin, *Executive Secretary,*
New York Medical Association.

### THE DANGER OF TYPHUS.

*Mr. Editor:—*

Is this country confronted with an epidemic of typhus, brought about by the flow of immigration, or the danger nil?

The public has full right to await an answer from, and expect all precautions to be taken by, medical men, whose duty it is to protect the population from an epidemic that is preventable. Having recently returned from Europe, where typhus is raging, I believe that it will be of interest if I relate a few of my experiences on this subject.

The people of Russia and Poland, with a few exceptions, are unfortunate in not having any baths in their homes, and they are obliged, therefore, to use public baths. Recently, the absence of fuel has caused the closing down of these baths. This condition, coupled with the scarcity of soap, water and underwear, resulted in conditions where vermin are multiplying without interference.

Every medical man knows how rapidly lice multiply, and thus, in the deplorable condition, I found Russia infested with vermin. A few hundred of these oviparous insects found on the human body is considered an ordinary case. I remember, when making calls on patients in Russia, I would place a chair in the middle of the room and leave my coat and hat on it, telling the people to keep away from the chair. Arriving at home, I would inspect my clothing and would invariably find three or four of the vermin.

The lice have so changed their adaptations to surroundings that they live on the walls, furniture, etc. The wooden walls and ceilings of the freight cars, which are now used for passengers, are infested with these vermin.

I can also remember that later, while in Constantinople, on the Island of Proti, where the American Near East Relief Committee took care of the Russian refugees, I warned Major Arnold, the director, to be careful while in contact with the Russians on the ship that brought them to the island. He smiled, thinking it to be imaginary. In his great desire to help these unfortunate people, he forgot the danger, and I constantly had to remind him by drawing his attention to the thousands of lice "promenading" on the clothes of the refugees.

Living in unsanitary conditions and being very poorly nourished, is it a wonder that in the city of

Odessa alone, there are over three hundred deaths daily, caused by typhus?

A station near Proskurff was on the battlefield between the Soviet and Ukrainian troops, but none dared to pass it, for it was full of typhus victims, both dead and alive. The two warring armies stood on both sides of the station for a long time, fearing to cross the typhus line.

The Germans have tried to impress upon the population of Constantinople, during the war, the cause of typhus, by putting out coffins at certain corners of streets and having a photograph of a large louse stinging the forehead of a man, who falls into the coffin. Thus typhus was named by the people "louse fever."

The prevention of the spread of the disease should be done thoroughly, no break being allowed anywhere, and, unless carried out properly, the disease will increase and multiply.

Very energetic measures were taken by us to stamp out typhus among the refugees on the Island of Proti (the American Island), letting the whole colony of Russians through a bath every three or four days, delousing their bedding, belongings, etc., at the same time, and only the rigid discipline on our island, and the strict businesslike manner in which we conducted the work, resulted in checking the disease with a small mortality, while the British, who were rather lax, had a high mortality, losing also one of their own physicians from typhus.

I am proud to state that, in spite of the tremendous work done by the American staff, and the constant contact with typhus patients, no one contracted the disease, while in one of our hospitals (I B) the Russian physician and all the Russian nurses contracted typhus, due to loose conduct.

Before leaving the island, every refugee was obliged to take a bath and allow all his things to be put through the delouser. An inspection of the refugees was then made and a certificate of disinfection was given when he was found free of vermin. But, after taking the bath, over fifty per cent. were found lousy, and frequently the same procedure was repeated three or four times before he was found free from vermin.

We learned that taking a bath does not always clean up a lousy person.

On my way to the States, I naturally was quite interested in finding out what the American authorities do to prevent bringing the typhus epidemic into the States, so in Patras (a large Greek port for immigrants) I went to the American Consul to consult with him regarding the precautions taken before the immigrants were allowed to leave the city. He assured me that everything was done according to science; every passenger was obliged to take a bath and his baggage was disinfected. My heart was full of joy to see the big signs on the immigrants' trunks, "disinfected," and my joy was coupled with merriment when I saw, outside the ticket office, the passengers busying themselves pasting on their trunks, which they had just brought from the hotels, the labels "disinfected," just received for a fee from the office.

I do not know what science was required to paste these labels on, but the consul was quite satisfied that it meant medical science.

In conclusion, I wish to state that I do not want to be quoted as saying that the fear of typhus should result in stopping immigration—it would be an insult to the medical profession—but I do believe that we should look upon the question of bringing into this country an epidemic of typhus very seriously, and that we should handle the matter with due consideration, making no distinction of the passenger, be he immigrant or American, first class or steerage.

S. G. Pavlo, M.D.

356 Ferry Street, Malden, Mass.

## SHARON SANATORIUM NOT A STATE INSTITUTION.

Boston, March 31, 1921.

*Mr. Editor:—*

The directors of the Sharon Sanatorium are deeply grateful to you for the admirable editorial in the edition of Thursday, March thirty-first. There is a mistake, however, in the early part of the article which we feel it is necessary to correct, as it may give a wrong impression to your readers.

You say: "The step taken by Massachusetts in establishing the Sharon Sanatorium as a *state* institution is particularly significant," etc. The Sharon Sanatoriom has never had anything to do with the state. It was founded by private subscription, and has been largely supported by private subscription ever since, and has never received any money from the state. It was the first institution of its kind in New England, and it was an experiment to prove that much more could be done than hitherto had been thought possible in the cure of tuberculosis at a low altitude and in harsh climates like that of New England. The first state sanatorium in the Union was opened at Rutland, Massachusetts, in 1898, seven years after the establishment of the Sharon Sanatorium. In the preliminary report of the later institution, the trustees stated that it was the success of the work at Sharon that induced them to completely change the character of the institution at Rutland, this change being due chiefly to the efforts of Dr. Alfred Worcester of Waltham, Massachusetts, one of the Trustees, who had watched the work at Sharon and believed that the character of the state institution should be changed from that of a mere hospital for consumptives, to a sanatorium for hopeful cases.

As the directors are particularly desirous that the means of support of the Sharon Sanatorium should be known to the public, and that it is in no way connected with the state, I trust you will be willing to print this correction in your next edition, and by so doing greatly oblige us.

With renewed thanks for the editorial, I remain, in behalf of the directors,

Yours very truly,
Vincent Y. Bowditch.

## SOCIETY NOTICES.

**Massachusetts Society for Mental Hygiene.**—The Human Element in Industry is the subject of the Annual Conference of the Massachusetts Society for Mental Hygiene to be held on Thursday, April 7, at 8 P.M., at Ford Hall, Boston. Dean Everett W. Lord of the College of Business Administration, Boston University, is to preside, and the following is the program:

1. "Has Mental Hygiene a Place in Practical Industry?" Boyd Fisher, Service Department, Lockwood, Greene & Co., Boston.
2. "Industrial Hygiene." Wade Wright, M.D., Secretary of the Division of Industrial Hygiene, Harvard Medical School.
3. "The Mental Health of the Industrial Worker." C. Macfie Campbell, M.D., Director of the Boston Psychopathic Hospital.

The public is cordially invited to attend this meeting.

**Suffolk District Medical Society.**—Censors' Meeting. The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Medical Library, No. 8 The Fenway, Thursday, May 5, 1921, at four o'clock.

Candidates should make personal application to the Secretary and present their medical diploma at least one week before the examination.

R. H. Miller, M.D., *Secretary*,
402 Marlborough St., Boston.

# The Boston Medical and Surgical Journal

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## Address.

## ADDRESS TO THE GRADUATING CLASS, TRAINING SCHOOL FOR NURSES, PETER BENT BRIGHAM HOSPITAL.*

Winford H. Smith, M.D., Baltimore, Md.

It is a distinct pleasure to me to have the opportunity of speaking to you this evening. A pleasure, because again I have the privilege of addressing the members of a profession which I hold in honor and respect, a pleasure which all foreigners like myself living outside of Boston feel at being asked to participate in any of the educational activities of this seat of learning and Hub of the Universe; a pleasure, because I understand that I am the first man to be allowed to come here on such a mission, a compliment which I fully appreciate, though not understanding the previous discrimination.

The pupils of this school are fortunate in that they are educated and trained in one of the most modern hospitals in America, situated in a city whose hospitals have always been leaders in upholding high standards in scientific work, nursing education and hospital administration, and this hospital is particularly fortunate in its close affiliation with a great medical school with its educational atmosphere, and in that it had its beginning under the leadership of that keen, sound and progressive administrator, Dr. Herbert B. Howard, who so long presided over another of Boston's famous hospitals, the Massachusetts General.

It is worth while to work in such an atmosphere, associated with the best traditions of the professions of medicine and nursing, though its significance and value is seldom appreciated at the time.

Since the first real school of nursing in America was established here in 1872, at the New England Hospital for Women and Children, we have travelled far. In ten years there were 22 schools with 600 graduates, and there are now approximately 1600 schools, with 50,000 pupils. But it is not merely by such growth that the importance of the nursing profession is manifest, but rather by the ever-increasing importance of the rôle which nurses are called upon to play. The early conception of the nurse was that she would be useful in furnishing proper care to the sick in hospitals and after becoming fully proficient, she would care for sick people in their homes. Today this is only one of the many and varied opportunities open to the nurse. She is needed and is filling important places in almost every phase of our civic and social life. It is concerning these opportunities, your responsibilities in the future program, and some of the serious problems to be faced, that I wish to speak briefly tonight.

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* December 3, 1920.

There are more pupils in our training schools than ever before and yet there is a shortage both of pupils and graduates. Why? The shortage of pupils is undoubtedly attributable to the fact that in the first instance the number of schools, so-called, has increased too rapidly without sufficient regulation, and in the second instance, to the attractiveness of the many and varied occupations, newly opened to young women, which do not require long and unremunerative preparation, while offering equal or better financial rewards with shorter hours and freedom from the heavy responsibility resting upon those dealing with human life when hanging in the balance.

The shortage in the number of graduates is most keenly felt by the public in the line of private nursing, and by that portion of the public which is able to pay for the private nurse whether she is needed or not. The reason for this shortage is that while the number of nurses graduating increases each year, the popular demand has increased and the previous proportion of distribution has not been maintained because an ever increasing number of nurses, soon after graduation, seek those opportunities which better satisfy their desire for real public service, to be free from the petty annoyances and exactions to which the private nurse is so often subjected. The desire for a wider sphere of usefulness, with more regular and shorter hours, and a greater measure of independence, all of which results in greater personal satisfaction in living, and the existence of new opportunities for gratifying that desire is the reason for the shortage of graduates as applied to private nursing. The shortage in other lines can easily be accounted for in the fact that those new opportunities have developed so rapidly and the demand has become so great that the supply has not kept pace. In addition to private nursing there are the opportunities as social service nurses, health department nurses engaged in tuberculosis work, and in the prevention of infant mortality, as visiting nurses, rural nurses, school nurses, industrial nurses, teachers, administrators, institutional nurses, and in the many other phases of public health work.

Possibly it is a good thing that the supply is not equal to the demand, perhaps because of it we shall the more quickly realize the necessity of differentiating between the essential and the non-essential, in the demand for nurses. For example, let us consider private nursing. I do not wish to give the impression that private nursing is no longer a worthy opportunity in nursing—far from it. It is an important field for the nurse, as important as any. What I do mean, however, is that the popular demand for trained nurses, countenanced if not encouraged by the medical profession, is out of all proportion to the need. Consider how many skilled nurses are today dancing attendance upon wealthy men and women, who are not really ill, but are "enjoying poor health," who want the nurse to wait on them, to read to them, to be agreeable companions, to brush their hair, to travel with them, as props to their self-indulgent and selfish lives. I yield to no one in my respect and admiration for a good nurse giving herself and her skill where it is needed. But when I see nurses trained to render skillful service in emergencies, capable of splendid things, becoming accustomed to the sort of private nursing which I have mentioned, I cannot help but feel sorry—yes, guilty—that we permit such a waste of professional equipment and ability. We see it every day in the private wards of our hospitals. The system is all wrong and does not make the best use of the talent which has been developed, and I hope the time will soon come, considering the need of the community at large, when nurses will not be available for such service; when the nurse herself, proud in her possession of special talents and skill, will be unwilling to serve merely as a companion, and will consider such work entirely unworthy of herself as a nurse. We have overlooked this most wasteful system and a reform is most desirable before considering the many radical and experimental methods of increasing the supply. I dwell upon this because we are face to face with a situation which calls for changes in the old order and it is essential that the pupil nurses, and particularly you, who are on the eve of realizing your ambition, shall get a proper perspective as to your opportunities and your responsibilities.

Consider the various lines which are open to you,—ask yourselves individually, "What line can I follow with greatest success, in the use of my talents for the benefit of others and with justice to myself?" It may be private nursing in its real sense, but not all are fitted for it; it may be as a visiting nurse, either in the city or the rural district, possibly as a social service nurse or as a teacher, or as an administrator. Decide as fairly as you can, but do not be content to follow the path of least resistance. Herbert Spencer has said, "To prepare us for complete living is the function which education has to perform." Your duty is to see that you use your education so that you live as completely as possible, which means with the greatest satisfaction to yourself and usefulness to others. Your satisfaction in and appreciation of all that life offers will be great in proportion to your usefulness and accomplishment in service to your fellow man.

I have said that we are face to face with a situation which requires a readjustment of present systems, a situation which has arisen because we have outgrown our original conception of nursing and are beginning to see that the training of the future should be that adapted to a large public service, that therein lies the greater field. We possess a wider knowledge and appreciation of social conditions, their relation to public health and the economic value of the prevention of disease. Public health work in its more general phases is coming more and more to the fore, and the trained nurse is an important factor throughout. The profession of nursing is here taking on fresh significance and the nurse of today who is concerning herself with that great problem, the protection of the health of the people, represents an idea still in the formative period, but destined to almost unlimited possibilities.

Not only is there a marked shortage in this field, but there is no definite system of training in preparation for this work. The situation which we face presents these questions,—how obtain an adequate number of nurses for the various lines of work, and how readjust the system of training to fit the new demands? There is much loose and unintelligent thinking going on and many seem to feel that all conditions can be satisfied by numbers alone, which is an entirely false conclusion.

These questions are of importance to you because some of you at least will have leading rôles to play in bringing about the new order, and you are all interested, or should be, in the future of your profession.

How readjust the training? Another question at once presents itself: Should not the three years' period be sufficient in which to provide the basic training for general nursing and at least the necessary grounding in public health nursing to enable a nurse, following graduation, to enter that field? Many hold that it does and this idea will probably prevail. I do not presume to say how the curriculum should be changed, but I am convinced that a change to that end is desirable. A carefully selected committee, financed by the Rockefeller Foundation, is now, and has been for over a year, working on this problem, and for the present we can hardly do better than await the report of that committee.

The immediate danger in the situation lies in the fact that there is an urgent demand for more nurses and the possibility that here and there misguided authorities may adopt such measures as the lowering of standards of admission to training schools, shortening the period of training, attempting to train a second grade of nurses without proper safeguards, or some procedure which will tend to discredit nursing as a profession in the minds of intelligent, educated young women, who are so necessary to the success of the larger program. We need not fear this except to the extent that it might complicate the situation and delay the solution. I think it may be said that the best thought is along the line of maintaining the present high standards of admission and of training, possibly of raising the standard as to what shall be required of training schools for nurses, thereby clearly defining and limiting those which are eligible, to give the broader training. But will it increase the number of nurses, and meet the needs of the situation in other ways? It would meet the situation in so far as it would supply the highly trained nurses and maintain the dignity of the profession, which is desirable; but it probably would not increase the numbers. In order to meet this demand the indications are that it will be necessary to develop a system for training another group of persons, competent to perform a limited function in the care of the sick, who would be called attendants, nurses' assistants, household nurses, or by some other appropriate designation. And there is undoubtedly a place for the woman who, while not a trained nurse, is competent to assist and to carry out the simpler procedures. We must recognize that there are many duties, many functions which are now performed by trained nurses which could be as well done by persons less highly trained, if properly supervised. This being the case, is it not logical to prepare for the training of this second group, rather than to consider other measures likely to destroy the system which we now have?

Before this is done, however, it will be necessary to establish such regulatory measures as will protect the public against fraud, against imposition by the untrained posing as a trained nurse, just as it has been necessary to legislate against the quack and self-appointed healer as a protection to the public.

There are many difficulties in the way, and one lies in the fact that our whole civic and state system is faulty in so far as relates to the care of the sick and the poor. The majority of our hospitals, particularly in the East, are supported by private endowment, either in the form of legacies or by voluntary contributions. It has become the accepted principle to establish a training school for nurses in every general hospital, and most special hospitals. This is done, not because of any interest in nursing education, but because it is the cheapest way of getting the nursing service. I am not blaming hospital boards for this, for it is common practice. That the system of nursing education, in America, is as good, if not better than in any other country, tends to show that the governing boards, when enlightened, have done the best they could, and many of them exceedingly well. The hospital is established for the care of the sick, and with limited funds, and these funds, obtained with great and increasing difficulty, it is not surprising that these hospital authorities are prone to regard the training schools as utilitarian, rather than as educational departments; and it must be expected that such boards will view with alarm any change which is likely to prevent them from operating training schools as at present, or that will increase the financial burden. Undoubtedly a very large number of hospitals in which so-called training schools are conducted should not be allowed to do so. In speaking of such schools, Dr. Hurd likens the lot of the pupils therein to the missionary in the Cannibal Islands, who, having accepted gladly an invitation to attend a feast, was much surprised, to say the least, upon his arrival to learn that he was supposed to furnish the feast. It is also equally apparent that a better basis of support should be provided for all training schools for nurses. Until states appreciate the necessity and the economic value of employing every means of conserving health of its citizens and recognize the training school for nurses as one of the means to that end, and support it, we must look to endowment by private philanthropists, for training schools should be endowed if their integrity as educational institutions is to be assured. Even so, if the utilitarian value of the school to the hospital is lessened, as will inevitably be the case if it is to be placed on a strictly educational basis, as it should be, the hospitals will have to provide funds for additional helpers in order to free the nurses from tasks which are utilitarian, rather than educational, in character. These are facts which must be faced, however, and cannot be allowed to interfere with a reform essential to the welfare of the public at large.

But what of the hospitals which are considered unsuitable for training schools, how will the sick in those hospitals be cared for? Is it not possible that in these hospitals the training of the second group, the attendants, should be and can be carried out under the supervision of graduate trained nurses? Many believe that it is, and I share this view. The average small general or special hospital could render perfectly satisfactory service with a sufficient number of graduates supplemented by a group of intelligent young women being trained in the simpler procedures of the care of the sick. This is virtually what is being done in many of the so-called schools. There are in the United States 6,440 hospitals of over 10 beds, of which about 4,900 have less than 100 beds, 817 from 100 to 200 beds, 447 from 200 to 500, and only 277 have over 500 beds. It would seem that there are ample hospital facilities for the training of both the fully trained nurse and the attendants in sufficient number to meet the demands of the hospitals, the public, and the public health program, especially if better use is made of dispensaries and out-patient departments. It must be emphasized, however, that unless this second group is definitely regulated by law as to the scope of its work and its members registered and controlled, it will not only endanger our whole nursing system, of which we are proud, and which we cannot afford to have endangered in any degree, but likewise the whole public health program, so far as nurses are concerned. We know how important the trained nurse of the present is to the physician and surgeon, and with relation to public health nursing, no less an authority than

Dr. C. E. A. Winslow, director of the Public Health Department of Yale University, says:

"All of this requires obviously enough a highly trained and specialized expert. I have no knowledge of the requisites for 'sick nursing,' but it is quite clear that in public health work the visiting nurse must be no empirically trained upper bedside servant. She must understand thoroughly the general fundamental laws of hygiene and sanitation, which means a mastery of the principles of physiology and bacteriology, and she must have a minute grasp of their special application in the field of her own work, whether it be school nursing, tuberculosis nursing or infant hygiene. She must know these things, not merely as a practitioner, but as a teacher, which means not only a knowledge of details, but a vision of their right relationship and a talent for effective presentation."

In the face of all of the evidence it seems reasonable to believe that the necessary adjustments will gradually be made in a manner that will safeguard the standards of nursing education, and the status of the nurse, and at the same time satisfy the new conditions. There are problems to be met and adjustments to be made, however, and my reason for discussing some of them at this time is in the hope of impressing you, the pupils of this school and of the graduating class in particular, that you will have a part to play in meeting the new conditions. Some of you will become leaders, and it is important that you look at the facts as they are, calmly and judicially, and avoid appearing to assume an attitude of aloofness and independence or of self-interest, which will discredit your judgment and your profession.

I have departed from the time-honored custom of eulogy and advice, but I am sure you have a proper sense of your own importance, and as to advice, you have probably had more than you can remember, and it is so easily given and so seldom followed.

I congratulate you on having completed your training to the end that you are now about to enter upon the practice of your noble profession fully equipped. I bid you welcome and godspeed.

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University of Alabama.—A Department of Hygiene, with Dr. Hiram Byrd as director, has been established at the University of Alabama, in coöperation with the United States Interdepartmental Social Hygiene Board.

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# Original Articles.

## FECAL UNITS AND INTESTINAL RATE, A BASIS FOR THE STUDY OF HEALTH AND INTESTINAL INDIGESTION.

By Francis Lowell Burnett, M.D., Boston.

### HEALTH AND DISEASE.

Health is a purely relative condition of the body, and perfect health—as Lord Lister said of perfection — is unattainable, but we must constantly strive for it. We must strive for health, because the first appearance of disease is invariably insidious, with little disturbance of the economy, and no visible signs of its presence. By and by a patient becomes conscious that all is not well with him; there is a loss of that feeling of well being which accompanies a healthy state. Disagreeable sensations arise, at first vague, but later becoming more definite, and these may become so urgent that he seeks advice. Still no evident signs of disease may be perceived on the most careful examination. By and by the disease, being situated in some organ or tissue, changes the constitution of the part, so that its presence is now recognized by a physical sign, when the clinical method usually employed reveals its character. And in this case the disease has advanced so far as to have damaged the tissues, and does not permit of our attaining one of the chief aims of medicine— cure.[1] In other words, decay and degeneration of the tissues only become factors in disease when they interfere with an individual's course of living. Such changes in the body must be due to some very definite and prolonged action of an injurious agent; and it has been said and suspected that an excess or deficiency of, or improper food may lead to very definite lesions.[2]

For fifteen years I have studied the health of an individual with special reference to diet, having experimented with an excess of food up to a point when the body weighed 97 kilos (215 lbs.); having also tried a deficiency, reducing the body to 77 kilos (170 lbs.); and finally increasing the weight again to what appears to be normal—86 kilos (190 lbs.), and maintaining it there within a few kilos for several years. And experiments have also been carried on with improper food or an excess of different foods. During the course of this investigation, I noticed a peculiar feature of the feces—as shown in Figure 8—that aroused my interest, and one that I have already reported.[3] This feature of the feces evidently represents a function—or seems more likely to be the end result of the complete action—of the intestine; and the maximum of absorption to be derived from the food. And within limits, it appears to act irrespective of the number of calories of food ingested, for when more food is consumed more is excreted; but it does appear to be very sensitive to a change in the kind of food, the proportion, the preparation for digestion, and some of the habits of an individual; and a loss of this action, as shown by the condition of the feces (Figures 10) may be the first sentinel to give a warning of a disturbance of the body. The application of this observation in the practice of medicine seems more accurate in principle than the dietetic methods in use at present: for by this means the way of taking food and its proportion are made subservient to bodily action, so that if an individual's habits, such as eating too fast and too much, eating too much sweet stuff, etc., are corrected, there should be a corresponding change in the character of the feces, and an improvement in health. For if feces entirely composed of small masses express the complete action of the intestines on its contents, they should be normal, and thus afford a means to determine intestinal indigestion from a new and more critical point of view, but are more intelligently applied to the maintenance of health and the practice of preventive medicine.

### FECAL UNITS AND THE ACTION OF THE COLON OF ANIMALS.

My first observation of a stool entirely composed of small masses was made at a time when the individual under study was considerably under weight, and it was formed in this way day after day; in fact, this was the only kind of a stool dejected for some time. Such a condition of the feces struck me as peculiar; but on an examination of the literature on this subject,

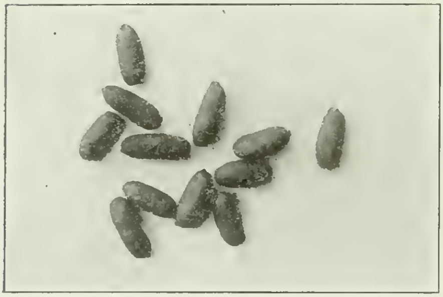

FIG. 1.

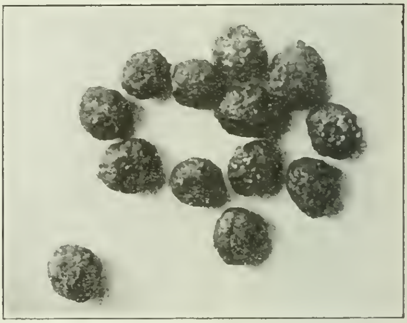

FIG. 2.

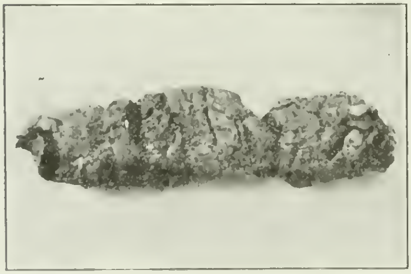

FIG. 3.

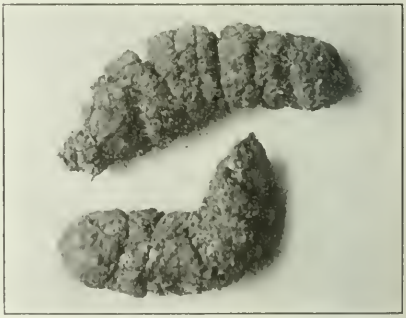

FIG. 4.

The dung of animals, entirely composed of units: Fig. 1 is that of the guinea pig; Fig. 2, the rabbit; Fig. 3, the dog; and Fig. 4, the monkey.

I found that it had been described previously, and was known as the "sheep dung[4] form," and the small masses were called sheep pellets, fecal nodules, and globules, and scyballous masses. These terms are awkward and not very descriptive; and when one considers that these masses are sometimes of a very exact size and form (Figure 1), units is a much more suitable name for them. On reflection, it occurred to me that units of dung were not only commonly dejected by sheep, but are readily seen in fresh horse droppings; and I have also observed that the dung of a monkey, the dog, the pig, the sow, the rabbit and the guinea pig is entirely composed of them, and some of these specimens are illustrated in Figures 1, 2, 3, 4. No doubt different examples may be found in the dung of other animals, but those mentioned are sufficient to show that units of dung are commonly dejected by all of these animals, and therefore this form may be regarded as normal.

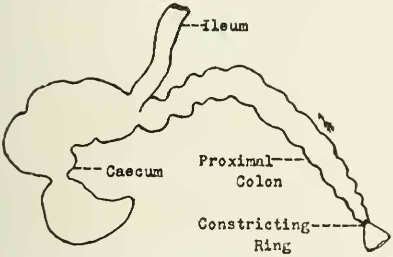

Fig. 5.—Outline of the proximal colon of a rat, in action. Note that the constricting ring forming the intermediate colon has closed, and waves of anti-peristalsis are running over the gut in the direction of the arrow. (Copy of drawing from Elliott and Barclay-Smith.)

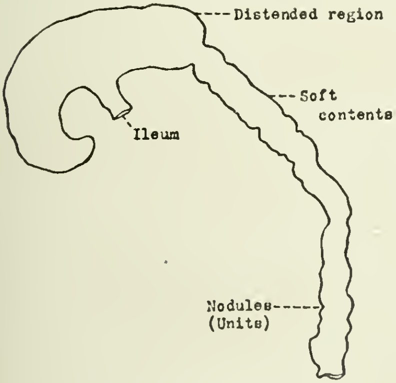

Fig. 6.—Outline of the proximal colon of a cat, in action. Note that the constricting ring is relaxed and the soft contents of the proximal colon are formed into nodules (units), which are being propelled down the distal colon by waves of peristalsis. (Copy of drawing from Elliott and Barclay-Smith.)

Such an assertion is strikingly corroborated, when the action of the large intestine of some of these animals is considered. Ordinarily, one thinks of the food as undergoing a continuous passage through the intestines; but that the movements of the intestines even in some of these animals is a very complex process has been shown by the investigations of Cannon,[5] and Elliott and Barclay-Smith.[6] They have found that the large intestine of the cat, the rabbit, the guinea pig, the rat (Figure 5) and the ferret, formed a constricting ring at times about one-third of the way along its length which made the gut into three distinct physiological parts; and each one of these parts had a distinct action. The first portion or the proximal colon is characterized by waves of antiperistalsis, the second or intermediate forms the fecal nodules or units; and the third the distal, moves the units along by waves of peristalsis alone (Figure 6). The proximal part, however, has the most complex action; for after a pultaceous mass of food passes into it, the tonic constriction ring, acting like a sphincter, closes, and successive waves of antiperistalsis pass over it to churn the food within. The action of these reversed waves makes the proximal colon a distinct physiological entity not unlike the stomach. This assertion is not only borne out by the action of these waves, but is also confirmed by the form of the ileocanal valve, by the fact that the administration of a cathartic and an enema to a cat will completely evacuate the alimentary tract except this portion, and finally by the fact that sometimes the tonic constriction ring which limits one end of this activity may at times be found well beyond a third or even half of the entire colon. Perhaps the length or capacity of the proximal colon with its waves of antiperistalsis may have some relation to the need of the body for nourishment, or there is a correlation between the size of it and the consistency of the intestinal contents. But the consistency of the contents may elicit another form of action; for instance, if the contents of the caecum of a rat are stiff and dry antiperistalsis is entirely held in abeyance, the mass is made into units or nodules in this appendage, and then passed along the entire colon by regular coördinated waves of peristalsis. Similarly, Cannon[7] has also found that the kind of food exerts some influence on the action of the stomach and intestines of animals; that is, if

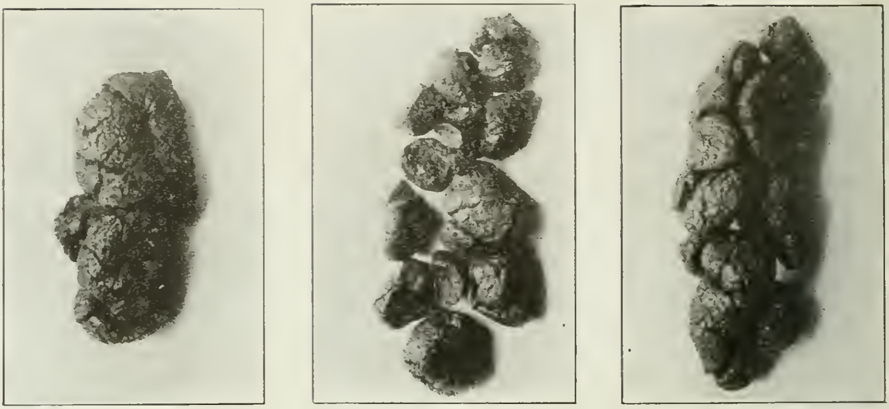

Fig. 7. Fig. 8. Fig. 9.

The feces of man, entirely composed of units. Fig. 7 is associated with an intestinal rate of about 70 hours; Fig. 8, about 60 hours; and Fig. 9, about 50 hours.

proteid, fat, and carbohydrate food of the same amount and consistency are given a cat, the proteid mass will remain in the stomach for an hour or an hour and a half, the fat about half an hour, but carbohydrates will usually be discharged into the intestine in ten minutes. And then proteid food may be seen to undergo rhythmic segmentation at almost any time, whereas fat and carbohydrate food seldom go through the process. Absorption in animals occurs largely in the small intestine; but if the consistency of the intestinal contents on entering and leaving the proximal colon is taken into consideration, some absorption must take place in this part of the gut. And then, as Cannon says, "inasmuch as the material in these segments (units) at first is soft so that they are easily compressible, while the fecal masses which are the final result, are hard and dry, it follows that even within the confines of these persistent rings, some absorption is taking place." Another point in regard to the influence of the contents of the intestine on its action, may be an observation of the English investigators on the dog. Of all the animals experimented with, this one alone showed antiperistalsis entirely in abeyance, and therefore it was impossible to give to the large gut its physiologic divisions. The stimulus used to elicit the action of the colon was a paste of pea flour and water; but as this animal is distinctly carnivorous, such a mixture may have been so incompatible with the bodily needs that it failed to bring into play the complete action of the gut, and the material was merely passed along by peristaltic waves and dejected. The formation of units is not alluded to, indeed the whole colon is described as a storage reservoir, which can be entirely evacuated at will. Antiperistalsis, however, has been observed in the dog by Cannon, and the stimulus he used contained a large proportion of animal protein.[8] The loss of antiperistalsis in the colon of the dog corroborates in a way, an observation that I have already made; and that is that the dung of the dog is not infrequently found in a soft, formless mass, without units. I have suggested that such a condition may be due to improper feeding; that is, too much food or more likely the ingestion of insufficient animal protein. Having given a brief review of some of the internal influences that affect the motility of the gut of a few animals, it is interesting to note that there are also external factors; for instance, Cannon has shown that all forms of motility are inhibited in cats, in the emotional state of rage or fear. From this account of the action of the colon on its contents in a few mammals, it is evident that the intestional movements are exceedingly complex, that suitable food is delayed in the proximal colon by waves of antiperistalsis where it is churned until a certain amount of absorption has taken place, then it is passed into the intermediate colon, formed into units, and carried by waves of peristalsis through the distal colon. And if it

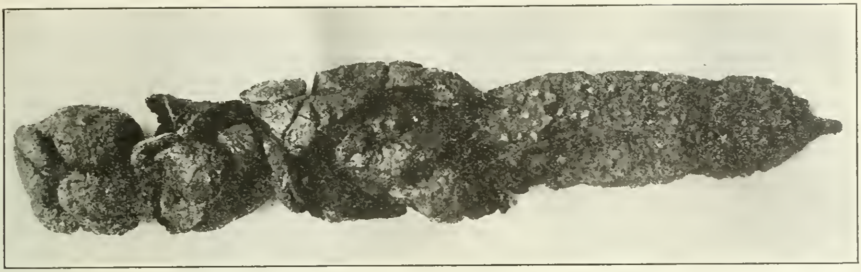

Fig. 10.—A large dejection associated with an accelerated intestinal rate, which, in part, is formed of units and in part made up of the foul and formless mass of intestinal indigestion. (The middle portion of this mass has spread apart on account of being dried and appears unnatural.)

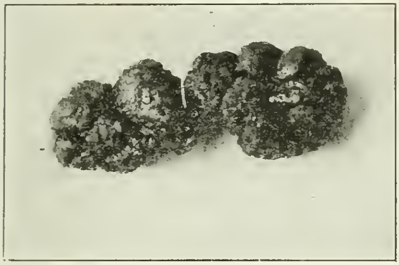

Fig. 11.—A small human dejection entirely composed of units which are undersized and represents a return of the feces to units after a foul and formless condition.

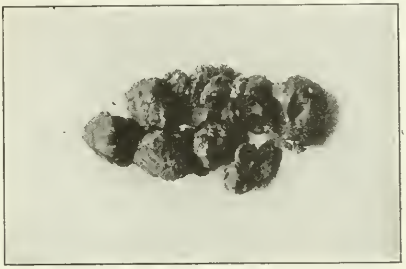

Fig. 12.—A dejection of an infant, entirely composed of units.

is not suitable—as a carbohydrate mixture in a cat—it is rapidly passed along the gut and the complete mechanism of digestion is held in abeyance. Accordingly all of these forms of intestinal movements are primarily dependent on internal conditions, as the kind of food ingested; but they are also affected by such subtle external influences as emotion.

FECAL UNITS OF MAN.

From articles previously written about the "sheep dung form" of stool, which at one time was supposed to be due to a stenosis of the gut, from odd observations I have made myself and some that have been reported to me, it is quite obvious that feces entirely composed of units may not be very uncommon. This assertion seems all the more logical when one composed of indefinite units, as shown in Figure 9, is put into this class. But a stool more like Figure 10 has been constantly observed in the dejections of the subject under study for a period of about ten years; and during this time there has never been any evidence of a stenosis of the gut, in fact this individual has experienced only an unusual degree of good health. Furthermore, several children, one an infant of eleven months, as illustrated in Figure 12, have been put on a basis by which units were generally dejected, and they seem to be in an improved state of well being. The units of a man vary somewhat in appearance from day to day. Generally, the units are definite but pressed together in a mass for dejection, as shown in Figure 8; sometimes they are like Figure 7 and fall apart on dejection; or sometimes, they may be indefinite as illustrated in Figure 9. Again, they may vary in size; some measuring 2 cms. across, while others are only 1 cm. across in this dimension. Then a stool may be composed of all kinds of units; or all of them may be small (Figure 11) and resemble those of an infant. But the form is not the only variation observed in the condition of the units. They also vary in consistency; for those that are discrete are hard and suggest a large amount of absorption, while those pressed together are softer. The units, too, are rounded and have a smooth surface, a point that is accentuated in the gloss of fresh horse droppings; but in man, the surface is indented here and there by faint and irregular lines (Figure 7).

Such marks are difficult to interpret, although they may represent the conjunction of particles in the process of haustral churning or segmentation. One of the most noteworthy characteristics of a stool entirely composed of units is the odor. It has an odor, but it is not foul and stinking: in fact, it is not any more disagreeable than the odor of fresh horse droppings or sheep manure. Considerable mucus is supposed to accompany a solid stool; but while a few shreds are sometimes apparent in one formed of units, they evidently represent only the normal desquamation of the mucous membrane. And in a microscopic examination of such a stool, the proteid particles are well digested, and free fat, fatty acids, or carbohydrates have not been seen. From this account of fecal units of man it is evident that an individual may keep on this basis for a long period of years, that the dejections of other individuals may be changed to this form by proper guidance, and that all of these human beings are unusually healthy.

*(To be continued.)*

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## ACUTE INVERSION OF THE UTERUS.*

By James L. Huntington, M.D., Boston.

It is by no means surprising that such a remarkable occurrence as the inversion of the uterus should have attracted the attention of medical authors from the earliest times. This phenomenon so fearful in its consequences, so sudden and so rare, is nearly as much a puzzle today as it was in the dark ages of medicine. For this reason it is the bounden duty of every obstetrician, promptly and fearlessly, to report with the utmost frankness and care every case that comes within his practice.

The title of this paper, "Acute Inversion of the Uterus" might better be expressed "Acute Puerperal Inversion of the Uterus," because I shall not touch at all on the condition of inversion which has been reported where a tumor has gradually caused by its weight the uterus to turn inside out, or where violent intra-abdominal pressure has brought about the same condition, for under these circumstances the condition is essentially chronic, and the feature of hemorrhage is lacking.

The question of etiology is perhaps the most interesting and in some ways the most important point to be discussed, because of the tremendously varying differences of opinion. The generally accepted idea as to the etiology of this condition is that the uterus becomes inverted solely because of the carelessness of the person in attendance—that it is due to traction on the cord, or undue pressure from above in expressing the placenta. I must frankly admit that such was my opinion before my recent experience.

Let us see what the recognized authorities, both ancient and modern, have to say on this subject. In A. D. 110, Soranus of Ephesus writes, "Inversion of the uterus may be brought about by the unskillful removal of the placenta." Churchill[1] in 1846 ascribes atony of one portion and active contraction of the rest of the uterus as the chief cause, believing that violence in extracting the placenta or even traction on the cord may occasionally cause this condition.

Harris[2] in 1880 writes, "A very general theory is, that it is caused, in many cases, by mismanagement of the third stage of labor, either by traction on the cord, the placenta being still adherent, or by improperly applied pressure in the fundus: . . . that such causes may suffice to start the inversion cannot be doubted, but it is probable that their frequency has been much exaggerated. . . . .

"In a large proportion of cases no mechanical causes can be traced and the occurrence of spontaneous inversion must be admitted."

Jellett[3] writes in 1905, "Three conditions must be associated in order to permit of this occurrence: enlargement of the cavity of the uterus; relaxation of part of its wall; and a cervix which is sufficiently dilated or capable of being sufficiently dilated to allow the passage of the body of the uterus. All these conditions are fulfilled after delivery in these cases in which the uterus does not contract well. With these conditions present, if the intra-uterine pressure becomes less than the intra-abdominal pressure, the fundus dimples in, and if this relation between the two pressures is continued, inversion goes on until it has become complete. Accordingly, all factors which cause such a relation between the two pressures may be regarded as the exciting causes of inversion. The more important of these are:

1. Dragging upon the placental site, in the case of a fundal insertion of the placenta, by pulling upon the cord while the placenta is still adherent.

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* Read before the Surgical Fortnightly

2. Violent straining associated with sudden emptying of the uterus, as: precipitate labor, or severe straining and pressure in the removal of the placenta, while the uterus is in a relaxed condition."

Williams[4] writes in 1904: "For the production of the accident two factors are necessary: marked laxity of the uterine walls, particularly at the placental site, and a patulous cervical canal. Inversion may occur spontaneously as the result of intra-abdominal pressure, or from the mere weight of the intestines, while in other cases it is attributable to violence resulting from the too vigorous employment of Credé's manoeuvre or to traction upon the cord.

"Beckman, who has carefully analyzed one hundred cases reported in the literature, believes that in the majority of instances the accident occurs spontaneously, while Vogel, in a similar review, holds that most cases are due to violence. His contention appears to be confirmed by Beckman's statistics, as only three of the hundred cases occurred in hospital practice. Indeed, it is highly probable that the accident is excessively rare when labor is properly conducted, but that it occurs more frequently under the unfavorable conditions existing in private practice, particularly as conducted by midwives."

L. V. Friedman,[5] writing in 1906, says, "However, the possibility of spontaneous inversion some hours after delivery of the placenta has been well established."

H. F. Day,[6] in 1912, writes, "It is usually caused by injudicious pressure on the fundus after delivery or by traction on the cord, while the placenta is attached. A uterus is predisposed to this when its musculature has been exhausted or lacerated during a severe and prolonged labor so that the contractions stop. They may begin suddenly again and assisted by intra-abdominal pressure cause the condition. Many authors claim that it is always preceded by paresis of some portion of the uterine wall."

Craigin,[7] in 1916, writes: "The conditions necessary for the concurrence of an inversion of the uterus after labor are a relaxation of the fundus and a dilatation of the cervix. With these conditions present it may occur in one of three ways:—

1. It may be pushed down from above.
2. It may be pulled down from below.
3. It may fall down spontaneously.

The most usual cause for inversion of the uterus is the improper application of Credé's method of expression of the placenta. This should be practised only while the uterus is contracted. If the fundus is relaxed it is a relatively easy matter to indent it, and when once an indentation has occurred, it is a still easier matter to continue this indentation into an incomplete inversion of the uterus. In the cases which have occurred and been seen by the author, this has been the etiology.

"It must be admitted that with a placenta adherent to a relaxed fundus, traction on the cord which used to be practised by ignorant midwives could produce inversion. This has not been met with in my experience.

"A number of observers have reported cases of spontaneous inversion of the uterus, in which a relaxed fundus fell down within a dilated cervix under the influence of the contraction of the abdominal muscles, or the weight of an adherent placenta. This, however, must be a rare occurrence, and it is wiser to consider an inversion of the uterus as usually the result of mismanagement on the part of the obstetrician."

Griffin,[8] writing in 1917, takes up the question of etiology as follows: In most works on obstetrics external violence is given as a factor in the production of inversion. Too firm pressure from above by the vigorous use of Credé's method or a short cord, precipitate labor, and traction on the cord especially, were given as a cause in a large proportion of the cases. Emmett says that if the latter were so, inversion ought to have been much more frequent in earlier times, when the knowledge of obstetrics was considerably less than it is now; but statistics show that the relative frequency of inversion has not changed. Beckmann carefully studied one hundred cases of inversion and concluded that it occurs most frequently in primiparae, and young persons, and that violent manipulations rarely play the most important rôle in the etiology; that on the contrary, more or less constant conditions, existing in the active birth itself bring about the puerperal inversion in the majority of cases. He says that the essential and necessary conditions precedent to the origin of a puerperal inversion is the relaxation or flabbiness of the recently emptied uterine body in its upper part, and an open os. He concludes that the spontaneous origin of inversion is more frequent than any of the previous writers have supposed.

Crampton,[9] in 1885, studied two hundred and twenty-six cases, and his conclusion in regard to its occurrence and etiology are as follows:

"1. Inversion is preceded by paresis of some portion of the uterine muscle (not necessarily the placental site), caused either by too frequent child-bearing, tedious labor, previous miscarriages, traumatism, emotional excitement, or too rapid labor. Traction on the cord may induce prolapsus; if severe, procedentia. It will never alone produce inversion, but may facilitate it, if paresis is present.

2. It is more apt to occur in primiparae.

3. This liability in primiparae is due to the peculiar emotional excitement preceding and associated with a first labor, reflected upon the exhausted uterine muscles for the first time called into unusual action. Given a slight degree of depression in any portion of the uterine body, and the natural vigorous contractions of the uterus in a first labor become a source of increased danger. Adherent placenta is frequently supposed to be a cause of inversion.

Athill[10] laid it down as a rule that in cases of inversion following parturition the placenta was invariably found to be attached to the central portion of the fundus. He comes to the conclusion that fundul attachment of the placenta was not alone the predisposing, but was the only cause of inversion. During his long practice, extending over fifty years, including ten years' residence in the Rotunda Hospital, first as assistant and then as master, he introduced his hand in the uterus many times in cases of retained placenta, many of them firmly adherent, and in no single case did he find the attachment anywhere except laterally, and in none of them was there the least tendency to inversion.

Hennig[11] noted the frequent insertion of the placenta at the fundus in these cases and thought that in partially detached placenta the accumulating weight of blood might favor inversion.

Bumm,[12] in 1908, points out that to produce this condition, first of all, the placenta must be placed at the fundus and that condition alone is enough to produce the inversion, but that, of course, any undue pressure or traction on this weakened fundus would favor the process.

This last view certainly seems most reasonable, and as the placental site is always described as at the fundus in reported cases of inversion of the uterus, when any mention is made of the placental insertion, it would certainly tend to strengthen this theory. Added to these is the extreme rarity of a fundul implantation of the placenta which would correspond with the extreme rarity of inversion of the uterus.

Certainly some other etiological facts besides pressure on the fundus or pulling on the cord must exist for these abnormal features are of the commonest occurrence, and inversion of the uterus happens so very seldom; and in the first case I am going to report, there was no traction on the cord, and no pressure that could be called such by the wildest stretch of imagination. In many clinics, forcible expression of the placenta at the end of five to ten minutes is the rule, and yet we do not find inversion of the uterus any oftener in these institutions. No, there certainly must be some underlying factor, and the most logical seems to be the fundul implantation of the placenta.

The symptoms of acute inversion of the uterus are usually given as profound shock, excessive hemorrhage, severe pain of a sharp, terrifying character, and yet many authors point out that any or all of these may be lacking.

In these days of the routine use of ergot and pituitrin, it is of the utmost importance that we should bear in mind the possibility of inversion of the uterus, and all the signs and symptoms, if the ideal treatment is to be followed, namely, reposition by pressure from below; it must be instituted early and before the action of ergot and pituitrin on the uterine muscle.

Nearly all authors speak of the absence of any uterine mass to be felt through the abdominal wall as a diagnostic sign of great value. It would seem to me, after my experience, that where there is any shock or undue bleeding, unless the mass to be felt through the abdominal wall is the typical spherical mass behind which the hand can easily pass, a vaginal examination is imperative. In the case reported below, I was at a loss to explain why I could not get behind the fundus when I was attempting to hold it. The consistency was not abnormal; the nodulated character was not unusual; the mass was high enough in the abdomen not to excite suspicion, but the characteristic feature of being able to hold the top of the fundus in the hollow of the hand was lacking, and was noted at the time before the diagnosis was made.

Both cases described below are of the commonest type, when the body of the uterus passes through the cervix, leaving the cervix hugging the mass like a collar. Of course the next stage would be rarer where the cervix also inverts, pulling with it the vaginal wall.

*Treatment.* Where the diagnosis is made early, as it should be, the mass can be pushed back as it came down, and Dr. DeNormandie is shortly going to report a case of his, where there was complete inversion with the placenta still attached to the fundus, where the whole mass appeared outside the introitus. He was able to peal off the placenta from the fundus, and replace the body of the uterus, holding his hand inside until the uterus shut down normally, and his patient had no hemorrhage, shock or pain.

When all attempts to replace the mass fail, it would seem to me that immediate laparotomy and restoration of the uterus by traction from above, with direct transfusion offers the best possible chance for success.

Of course this cannot be accomplished without such a marvellous equipment as that which Dr. George Minot has furnished the surgeons of Boston with carefully tested and properly grouped donors always available on telephone call.

Where shock or failure to make a diagnosis has allowed days to intervene from the onset of the symptoms to the time of operation, we have two choices: first, a laparotomy with attempt to replace by traction from above and pressure from below the vagina, and if that fails, by hysterectomy; and second, the so-called Spinelli operation. In this, the vesico-uterine peritoneal pouch is opened, the cervix is stretched from side to side, and an incision is then made through the cervix and uterus to within one-third of an inch of the fundus. The uterus is then easily re-inverted, and the incision closed, as in Caesarean section.

Case 1. No. 416; aged 33; American by birth; para iii. Patient had a normal labor with her first baby; normal rapid labor with her second. The present labor was terminated by easy, low forceps. The baby weighed seven pounds, nine ounces. Fifteen minutes later, gentle pressure on the fundus revealed the placenta at the introitus. Pressure given at the sides of the fundus with extreme care and the placenta was easily delivered. There was moderate bleeding after the birth of the placenta, and ergot and pituitrin were given subcutaneously as routine. Pulse 80, and only fair quality. What appeared to be a rather nodulated fundus seemed hard and well contracted. Bleeding continued and the pulse became a little poorer in quality. Ergot was repeated after half an hour, and patient complained of no pain. Pulse remained at 80, but the patient looked pale and drawn, and at the end of three quarters of an hour, preliminary arrangements were made for a transfusion, should it be necessary. Every five to ten minutes there would be a gush of about one-half ounce of dark lochia. At the end of an hour, patient's pulse became decidedly weaker in character, and gradually began to increase in rate. Seen by Drs. Minot and Reggio one hour fifteen minutes post-partem, and immediate transfusion advised. Pulse, 120. Bleeding from the uterus seemed to be increasing, and while preparations were being made for a transfusion, I decided to pack the uterus. Upon introducing my hand into the vagina, a smooth mass was found projecting through the cervix, the cervix hugging it tightly like a collar. The entire body of the uterus seemed in the vagina. More careful examination revealed a roughened area over the fundus, evidently the placental site. Upon an attempt being made to replace the fundus by pressure from below, blood poured from the vagina. Immediate laparotomy decided upon without further attempts from below. Patient almost pulseless. Iodine preparation on the table, as transfusion was started. Low median incision. Rather thick pad of subcutaneous fat encountered. Peritoneal cavity opened, and what proved to be the lower uterine segment with appendages drawn into the crater presented at the wound. A thick bite of the uterus was seized with Ellis forceps in the median line just inside the crater. With moderate traction it was brought above the ring, and a bite seized lower down, and so bit by bit the uterus was drawn back through the ring. It appeared firm, but rather pale, but the color returned rapidly, and no attempt was made to fix the uterus. Another ampule of pituitin was given, however.

By this time the transfusion was about half over, and the patient's pulse was strong at the wrist, decreasing rapidly in rate. Abdomen closed in layers. Dry dressing. At the conclusion of the transfusion, patient's pulse was 90, and blood pressure 100. Patient made an absolutely uninterrupted convalescence, but the lochia was quite scanty. Six weeks later the uterus was found in anterior position, freely movable, normal size; cervix long and conical. Os practically intact, and much smaller than usually met with in a multipara.

Case 2. Boston Lying-In Hospital. House No. 24152. Seen in pregnancy clinic October 17, 1917; 37 years 1 para. American. Family and past history negative. Physical examination negative. Pelvic measurements, 30-25-18½. January 11, 1918, normal primiparous labor, nine hours. Baby weighed five pounds, eleven ounces; cord twenty-two inches long. Placenta, one pound, one ounce. Placenta came away incomplete, and patient had slight post-partem hemorrhage, so cavity of uterus explored and small piece of placenta removed. Ergot and pituitin given S. C. Pulse 160; not enough hemorrhage to account for condition of shock. Given 500 c.c. of salt under each breast. Pulse 140. Patient had routine treatment for shock and condition gradually improved. Had occasional slight hemorrhage, however.

January 12—p.m., temperature, 99.5; pulse, 118; condition improved. January 13—p.m., temperature, 100.4; pulse, 130; about the same. January 14—p.m., temperature 100.4; pulse, 104; pads foul; January 15—p.m., temperature, 102.8; pulse, 140; pads foul. Patient has been unable to void satisfactorily, so catheterized and 69 ounces obtained. Pads more foul; intra-uterine douche advised. This was attempted and diagnosis of inversion of uterus made. January 16—Under ether, an attempt was made to replace body of uterus. This was unsuccessful; patient went into extreme shock. Morphia, sub-pectoral salt and rectal tap again restored her to good condition. January 17—Under ether, another attempt was made to replace body of uterus. This was unsuccessful, so a laparotomy was decided upon. Median incision from symphysis pubis almost to umbilicus. Uterus found completely inverted, tubes being drawn in with fundus. An attempt was made to stretch the ring above and push the fundus up from below, but efforts failed. The posterior vaginal wall was finally split; the uterus then was pushed up, and a hysterectomy performed, a small portion of the cervix being left *in situ*. A drain was passed from pelvis into vagina; a second drain passed from pelvis out through abdominal wall, which was closed to the wick. Patient put to bed with pulse of 160; fair quality.

Patient recovered from shock of operation, but died sixteen days later of sepsis and exhaustion.

### CONCLUSIONS.

1. Acute inversion of the uterus, post-partem can occur spontaneously.
2. Insertion of the placenta in or near the fundus of the uterus seems the most probable etiological factor.
3. Realizing the possibility of encountering the fundus weakened by being the placental site, great care should be exercised in expressing the placenta by pressure from above.
4. Shock, whether or not accompanied by post-partem bleeding, should demand immediate vaginal examination, unless the typical spherical fundus can be plainly felt through the abdominal wall.
5. Where the diagnosis is made too late for manual reposition from below, immediate laparotomy and reposition by traction with direct transfusion, offers the best chance for a successful outcome.

### REFERENCES.

[1] Churchill, Fleetwood: Theory and Practice of Midwifery. 1846. p. 480.
[2] Harris, R. P.: Playfair's Science and Practice of Midwifery. 1880. pp. 437, 438.
[3] Jellett, H.: Manual of Midwifery. 1905. pp. 895, 896.
[4] Williams, J. W.: Obstetrics. 1904. p. 730.
[5] Friedman, L. V.: Inversion of the Uterus. Jour. A. M. A., Dec. 23, 1905.
[6] Day, H. F.: Inversion of the Uterus. Boston Medical and Surgical Journal, Vol. clxvii, No. 11,pp, 361. 364, Sept. 12, 1912.
[7] Cragin, E. B.: Obstetrics. 1916. pp. 592, 593.
[8] Griffin, J. M.: Report of a Case of Acute Inversion of the Uterus Following Parturition. Am. Jour. Obstet. and Dis. of Women and Children, Vol. lxxvi, No. 4, 1917.
[9] Crampton: 1885. See Griffin. Reference 8.
[10] Athill: See Griffin. Reference 8.
[11] Hennig, C.: See Griffin. Reference 8.
[12] Bumm, E.: Grundriss zum Studium der Geburtshilfe. Wiesbaden, 1908, pp. 647-649.
[13] Minot, G. R.: Group Testing for Transfusion Donors. Boston Medical and Surgical Journal, Vol. clxxiv. p. 667, 1916.

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## A CASE OF MYOSITIS OSSIFICANS TRAUMATICA DEVELOPING FROM TORN CORACO-CLAVICULAR LIGAMENT WITHOUT OTHER BONY FRACTURE.

By Herman W. Marshall, M.D., Boston.

The thirty-two-year-old man, whose case is reported, was very well developed muscularly and in excellent health when he was injured. He was at work, lying on his back on the floor under a Ford touring car, when a wooden block started to split that had been placed as a support under the machine while a wheel was removed.

He attempted to roll quickly from beneath, but the running board pinned him down with one shoulder against the floor, and with a brace of the running board pressing down on the other shoulder, the right one, that was injured most.

He was extricated instantaneously, for he managed to make noise enough when the car squeezed out his last breath, to attract attention. He was able to get up immediately and went to a hospital on the following day, where he remained with both shoulders supported in bandages. The right one was held in a sling for nine weeks, and afterwards he managed to return to special light work within a few months of the time of his accident.

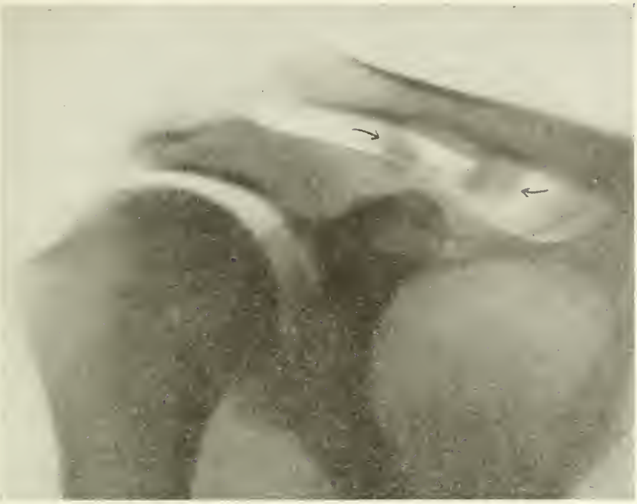

FIG. 1.

The writer saw him first, seven months after his injury. Prominent clinical features then were loud crackings and snappings when the scapula was rotated in movements of the arm. Pain was referred to the forearm, just below the elbow, and to anterior and posterior margins of the axilla. He continued to do whatever work he felt able to, and at a second examination, one year after his injury, the unusual scraping continued unabated. X-rays previously had shown no bony fractures, and additional ones taken one year after the accident, exhibited only slight changes around the acromio-clavicular joint.

No suspicion of serious rupture of the coracoclavicular ligament was entertained at this time, although it was realized that there had been some unusual injury. Six months later, and eighteen months after injury, he presented nearly the same appearance, and he had continued to work during the interval. Practically all shoulder motions were possible now, with difficulty and hestitation. Extremes of scapula rotation were painful. Adhesive strappings relieved him considerably, and with this assistance he continued to support his family and run an automobile a part of the time.

Diagnosis of myositis ossificans traumatica was made, first from x-ray findings at one of the Boston hospitals about twenty-one months from time of original injury. An immediate operation was advised, but apparently the severity of damage to the coraco-ligament was overlooked. He could not afford to lay off from work, and it was agreed that he could postpone surgical treatment safely as long as he could continue to work and to improve.

Another x-ray was taken, which is reproduced in Figure 1. It shows two bony masses growing from the under surface of the clavicle at the site of the attachment of the coracoclavicular ligament. Interpretation of the details of his injury, in view of these x-ray findings, makes it seem plain that the injuring force was transmitted through the humeral head to the glenoid fossa of the scapula without much direct pressure on the acromial process. Strain was thrown mainly on the coraco-clavicular ligament, and its trapezoid and conoid divisions both were broken instead of the outer end of the clavicle, as would have happened, presumably, if the acromion had been pressed directly and strongly. The two acromio-clavicular joints appear alike on the two sides, and both are somewhat relaxed.

An adhesive strap girdle was applied about the shoulder in a new manner when the extent of the injury to the coraco-clavicular ligament was fully realized, and loud crepitus was stopped instantaneously. Then a leather girdle was prepared that is shown in Figure 3, which accomplishes the same result.

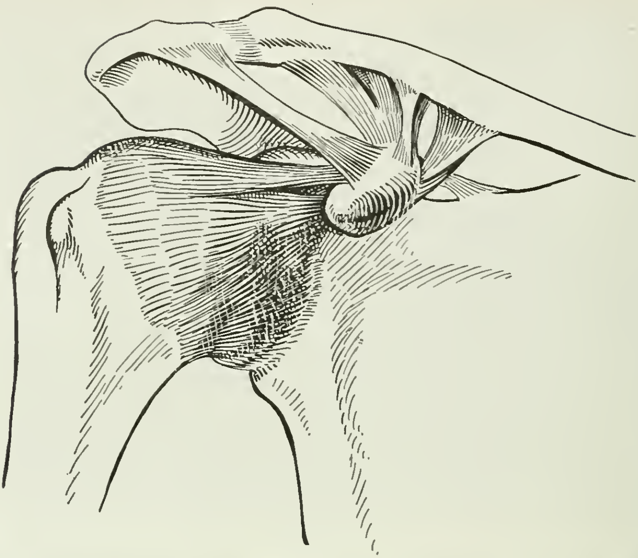

Fig. 2.

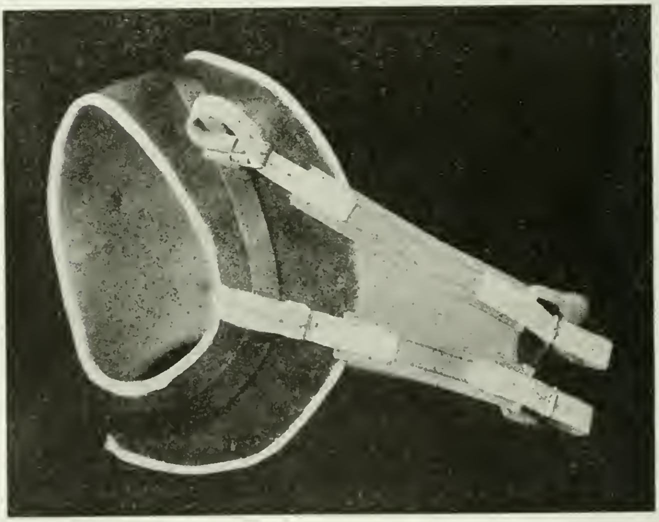

Fig. 3.

At the time of application of this support, twenty-two months after injury, he had considerable weakness of the arm. Light swinging of the arm back and forth, without much muscular force, no longer caused loud crepitus, but with tense muscles it persisted. He could lift 70 pounds with his right arm hanging extended, in contrast to 180 pounds possible with the left arm. Tenderness to direct pressure existed only over the front of the shoulder-joint at its inner side, and was felt in an inconstant manner in certain positions of the arm. This was interpreted as tenderness of the deeply situated coracoid process when its tip was pressed on occasionally in certain postures. The patient said there was a sore spot deep in the shoulder and indicated, himself, the location of the coraco-clavicular ligament through the trapezius muscle behind the clavicle on top of the shoulder. Neither the clavicle itself nor the acromio-clavicular region were tender. He could crawl again under cars to repair them, but favored the right arm a great deal.

This paper was prepared at this stage of progress, and questions might be asked whether he was receiving proper care, whether he should be operated on, and what his future prospects were likely to be.

Figure 2 is introduced to make clear the anatomical features of the case. The scapula is slung up to the clavicle by the strong coraco-ligament and it swings back and forth in movements of the arm from this fixed point. If this ligament is ruptured, then the shoulder blade can plough among the tissues in abnormal fashion, catching irregularly on underlying muscles and giving rise to audible coarse crepitus and snappings as obstructions are overcome.

The girdle of adhesive straps restricted scapular motions to some extent, and made the collar bone and shoulder blade move again as a normal unit sufficiently well to abolish the abnormal scraping. He noticed immediately there was very little shoulder pain on twisting the arm, but that it did not prevent the pain and weakness in lifting. Painful pulling on the coraco-clavicular ligament, through insertions of coraco-brachialis and biceps muscles into the coracoid process and evidenced by pain in the elbow in lifting, can be relieved only by additional strappings along the course of these muscles. The front straps of the leather girdle have been made of strong elastic webbing to permit freedom of respiratory movements, while thin steel straps reinforce the leather and prevent it from stretching in undesirable ways. The apparatus encases the shoulder blade and holds it tightly to the chest wall and clavicle, and relieves the damaged coraco-clavicular ligament very considerably.

Operative interference might permit repair of the ligament, and allow removal of the bony periosteal overgrowths.

If the abnormal bony masses which are intimately associated with ligamentous fibers were excised, there would be considerable sacrifice of ligamentous fibers, and there might be difficulties in approximations of torn ligamentous ends afterwards, so there are fair chances that ligaments might be weakened, rather than strengthened, by surgical measures directed mainly toward removal of bony defects.

It is known that proliferating detached periosteum will continue to proliferate for a while in these cases of myositis ossificans and then shrink usually into a quiescent state. It will not become a malignant tumor. Mention should be made of a new conception of myositis ossificans traumatica, that has been advanced recently by Dr. Charles F. Painter of Boston.

He believes there is a peculiarity; or diathesis, in persons who exhibit these periosteal overgrowths since all persons who suffer periosteal damage do not develop myositis ossificans. The process depends on two factors, a diathesis plus a mechanical factor. It would seem that slight traumata, in some cases, are sufficient to start the process, while in others more unusual conditions are required to make loose bits of periosteum grow free in the soft tissues. He would explain instances of myositis ossificans *progressiva* as due to a very marked tendency of the same nature toward periosteal proliferation, which results in production of the condition without traumata except ordinary continued mechanical strains accompanying usual body motions.

It seems to the writer that Dr. Painter's contentions are correct, and if so, then the patient under consideration is not liable to much more bony hypertrophy after his severe injury. X-ray appearances show a tendency toward well-defined, limiting outlines of bony surfaces which harmonize with this idea.

These bony abnormalities are doing no apparent harm, and therefore should be left undisturbed as long as he has as good function as at present, although from a scientific medical standpoint, it would be interesting to examine his shoulder surgically.

Distribution of pain suggests that the musculo-cutaneous nerve is involved in pains referred by the patient to the forearm just below the elbow, while pains felt over the margins of the axilla anteriorly and posteriorly perhaps can be explained as of circumflex nerve origin.

Muscle atrophy has been rather slight, and not more than can be accounted for, easily, by continued disuse. He is still very muscular.

If an opinion were demanded regarding his future prospects, it seems probable now that there will be some slight disability at least for a year or so longer. It would not be surprising to have him slowly recover, very gradually, and eventually become unconscious of remaininig weakness, after he learns to favor himself perfectly. Or it can happen easily, that he will keep the shoulder weak from continued slight overuse, so that the coraco-clavicular ligament becomes permanently weakened to very noticeable degree. If this happens, it can be operated on whenever disability justifies additional loss of time and surgical risks. While operation has not been advised in this unusual late case, it is probable that surgical repair of more recently torn ligaments without periosteal overgrowth represents the best treatment usually in the earlier stages, if diagnoses are made.

## Clinical Department.

### A FURTHER CASE OF TUBERCULAR MESENTERIC GLANDS.

By Joseph M. Lynch, M.D., Boston.

Apropos of the two cases of tuberculosis of mesenteric lymph nodes recently reported by Dr. H. M. Clute (Boston Medical and Surgical Journal, September 30, 1920), the writer wishes to report a similar case observed while the patient was on the service of Dr. E. N. Libby at the Boston City Hospital.

It illustrates well the fact that a condition will obscure a diagnosis, or rather complicate a correct diagnosis, which later may be very simply explained.

The patient entered the hospital on January 4, 1920, spoke but very little English, and the history was obtained from an interpreter as follows:

G. C., male, aged 27. Born in Poland. Occupation, laborer. Chief Complaint—Abdominal pain and vomiting. Family History—Father and mother living and well. One brother and six sisters living and well. No known exposure to tuberculosis. Past History—Always well, so far as known, except for influenza pneumonia one year ago. Recovery good. Habits—Good. Denies luetic or gonorrheal infection. Present Illness—For the past eight months has had epigastric pain, fairly well localized in the epigastrium. Pain sharp at times, and is periodic. Pain comes on usually at night; does not radiate, and at times is sufficient to keep patient awake. Attacks of pain are usually accompanied by spells of nausea and vomiting at times, the patient being unable to retain even water. Vomitus consists of food eaten, has never been yellow, blood-tinged, or black. Never jaundiced. Has not noticed his stools.

Physical Examination—Fairly well developed and poorly nourished young man, with evident loss in weight. Not prostrated. Head—No scars or exostoses. Eyes—Pupils equal, regular, react normally. Ocular motions normal. Sclerae clear. Ears and Nose—Normal. Mouth—Tongue protrudes straight, clean, moist. Teeth—Good condition, well cared for. Throat—Normal. Neck—No rigidity or retraction. Nodes—None. Chest—Symmetrical; expansion equal. Heart—Within normal limits in size. Action regular, sounds good, no murmurs. Lungs—No abnormal dullness. Breath sounds normal. No râles. Abdomen—Level. No abnormal bulging. In the left upper quadrant to the left and above the umbilicus is a tumor the size of a hen's egg, nodular, firm, fixed, and not movable with respiration. Slight tenderness on pressure of mass. A smaller mass, size of large almond, freely movable, not attached to structures and not tender, is felt just to the right of the larger mass. Liver and spleen not felt. Extremities—Normal. The urine was repeatedly negative, at no time sugar being present. Stools showed presence of undigested fat. Temperature and pulse remained normal. White Blood Count—12.000. Differential—Polymorphonuclears, 53%; small mononuclears, 29%; large mononuclears, 18%. X-ray of Lungs—Both apices showed marked increase in density and mottling. Lungs otherwise clear. Pulmonary tuberculosis.

Further Observations—Patient's condition remained unchanged. On January 18 a bismuth series showed stomach high and transverse. Duodenum posterior. Tender in left flank, below stomach. Small bowel distention and delay (adhesion). Appendix beaded. Chronic appendix.

On January 20, 1920, patient was transferred to surgical service and operated upon on January 21. A high median incision was made, and the following was found: Large, firm mass of mesenteric glands in the region of the transverse colon at the attachment of the mesentery. Mesentery throughout studded with enlarged glands. No attempt at removal made. Wound sutured. Patient was later transferred back to the medical service, and subsequently discharged from the hospital. A later note is to the effect that the patient is at present at Rutland.

Apparently from the location of the tumor and its fixation, it seemed probable to be a pancreatic tumor of some kind, but the location of the mass, in the mesentery, close to its attachment, and preventing the moving of the mass with respiration, readily explained why it might well be called a tumor of the pancreas, which later was disproved.

# ANEURYSM OF THE SPLENIC ARTERY, RUPTURING SIMULTANEOUSLY WITH PARACENTESIS ABDOMINIS.

By Joseph Garland, M.D., Boston.

History—D. C., male, aged 52, a granite polisher, was admitted to the Massachusetts General Hospital on the East Medical Service, Hospital No. 238041, August 6, 1920, complaining of dyspnoea on exertion, and edema. Family History—Negative. Past History—The patient had had a bad attack of tonsillitis thirty years ago. He had had gonorrhea at 29; syphilis was denied. The cardio-respiratory history was negative with the exception of an indefinite story of palpitation for twenty years. He had had nocturia, two or three times a night, for six years. Present Illness—About four months ago, after working for two days with wet feet in a ditch, the patient's feet became swollen at night. He stopped work for one week, lying down most of the time. The abdomen was slightly distended. Although the swelling was not much reduced, he returned to work at the end of the week. After half a day the swelling was greatly increased and he became dyspnoeic and returned to bed, where he remained five weeks. Five weeks before admission he again got up and was about for three weeks, although the edema still persisted in the face and hands. He became worse, and a week before admission was obliged to go to bed again.

Physical Examination—The patient was well developed and nourished, and of good color. The left pupil was greater than the right, but both reacted to light and distance. The right eye contained a small retinal hemorrhage. A few fine râles were present in the bases of both lungs. The cardiac impulse was seen and felt in the fourth costal interspace, 13 cm. to the left of the mid-sternal line. The action was slightly rapid. The aortic second sound was greater than the pulmonic, and accentuated. A systolic murmur was present at the apex, and a diastolic murmur was heard over the left fourth interspace at the sternal border. The pulses were equal and synchronous, and of high volume and tension. The artery walls were palpable. The blood pressure was 210 systolic; 125 diastolic. The abdomen was distended and tympanitic, with a definite fluid wave and shifting dullness. The liver dullness came to the fourth rib; the edge was not felt. The scrotum and feet were edematous, and a fine tremor of the arms and hands was present. The knee-jerks were normal.

During the patient's stay in the hospital the temperature varied from 98° to 103° F. A trace of albumin was present at every urine examination. There was marked fixation of gravity and a total chloride output of 0.895 grams on the Schlayer diet. The sediment contained white and red blood cells and rare granular casts. R. B. C.—3,000,000. W. B. C.—9,000 to 24,800. Non-protein nitrogen, 84.3 to 108.6 mgm. per 100 c.c. of blood plasma. Blood phosphates as P, 11.8 mgm. On two examinations the stool contained occult blood. August 7, blood Wassermann negative. August 17, blood Wassermann strongly positive.

X-ray of Heart—"Very definite change in heart shadow, especially to left, and apparent widening of supracardiac shadow which may be due in large part to tortuosity and high position of heart; probably sclerosis. May be some dilatation. Right border, 6 cm.; left, 13 cm.; transverse, 19 cm.; length, 20.1 cm.; base 9.1 cm.; width of great vessels, 9.5 cm.; internal diameter of chest, 28.5 cm."

August 11, digipuratum gr. iii, three times a day was started. August 15, digipuratum reduced to gr. iss, three times a day, and the patient was put on Karrell diet. August 16, abdominal paracentesis was performed, and 5500 c.c. of slightly cloudy, straw-colored fluid were withdrawn. Specific gravity, 1,010; cells, 510, all lymphocytes. August 19, the temperature and white count were elevated, and the patient was noticeably weaker. Both bases were dull. The edema was gradually disappearing. August 20, abdominal paracentesis was performed at 9 a.m., the trochar being inserted in the midline about midway between the umbilicus and the symphysis pubis. After 1200 c.c. of slightly cloudy, reddish fluid had been withdrawn, the flow stopped. As there still seemed to be fluid in the abdomen, the tap was repeated, the trochar being inserted one-half inch lower. Immediately the patient experienced a sharp pain in the abdomen, and the needle was withdrawn. Slight bleeding from the puncture wound followed, and the patient became pale and showed signs of collapse, with a weak and thready pulse and cold extremities. The respiration was periodic and gasping in character. Intravenous injection of normal saline solution was attempted, but the veins were so collapsed that they could not be entered. Death occurred at 12.30 p.m.

Autopsy 4109, performed by Dr. Oscar Richardson—"The peritoneal cavity contains about 3000c.c. of thin bloody fluid and a large amount of frank currant jelly-like blood clot, weighing about 1100 gms. From a point about 4 cm. from the end of the tail of the pancreas and extending along and about the organ and involving the head, there is a very thick layer of frank blood clot extending into the pancreas and into the lesser peritoneal cavity. The roof of the peritoneal cavity is disintegrated, and the blood clots are more or less continuous with those in the greater peritoneal cavity. The first portion of the splenic artery from a point about 6 cm. below its origin is capacious and negative. At this point a fibrous rounded ridge extends around the vessel with considerable decrease of its lumen. At a point about 3½ cm. from this ridge the vessel presents another ridge, slightly calcareous. It produces considerable diminution of the lumen. Between these two rings rests an aneurysmal sac about 3 cm. in diameter. The wall of the sac is thin, fibrous, and shows at one place a small area of fibro-calcareous change, within which there is a small irregular crevice about 4 mm. long, which extends through the wall into the region of the blood clot. The artery beyond the aneurysm is very tortuous and capacious, but shows only a slight amount of fibrous sclerosis. The sac contains a small amount of blood and blood clot."

### COMMENT.

This case is interesting on account of the extreme rarity of the lesion, but especially so on account of the dramatic ending; the rupture occurring simultaneously with the simple procedure of abdominal paracentesis. The reason for the rupture at this particular moment can only be conjectured. The excitement of moving the patient and performing the tap might have temporarily increased the blood pressure to the aneurysm's bursting point, or the withdrawal of a liter of fluid from the abdomen might have caused a relative drop in the pressure of the structures surrounding the aneurysm. It is hard to believe that the rupture was due to a simple coincidence. Direct trauma from the trochar was shown at autopsy to have been quite impossible.

In over 4100 autopsies at the Massachusetts General Hospital, aneurysm of the splenic artery has been found three times. The author has found 17 cases mentioned in the literature, the most recent of which, reported by Högler,* is said to have been diagnosticated during life.

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* Högler: Aneurysm of Splenic Artery. Wien. Arch. für in. Med., August, 1920, p. 543.

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## A CASE OF CONGENITAL CYSTIC KIDNEYS AND OTHER CONGENITAL ANOMALIES.

By Lawrence Weld Smith, M.D., Boston.

[From the Medical Service of The Boston Floating Hosital and the Pathological Department of the Harvard Medical School.]

The following case with its autopsy report is of interest chiefly because of the multiplicity of the congenital anomalies, the most striking of which are the twisted, thickened, hydropic ureters and the almost microscopic cystic kidneys. A plate illustrating this feature of the case is appended. Any theorizing concerning the possible etiology of such marked anatomical variations might well be regarded as superfluous. This report is intended merely as a record of fact, and whatever embryological speculation it may arouse is left forthwith to the reader.

Both the clinical history and the pathological report are abbreviated as much as is consistent with presenting the essential features of the case. The baby was admitted to the service of Dr. Paul W. Emerson, to whom I am deeply indebted for the clinical notes.

Clinical History—Joseph G., Hospital No. 3457, aged, 2 months, August 4, 1920. Family History—The father (aged 28 years), mother (aged 27 years), and three children (aged 6, 4 and 2 years, respectively) living and well. The mother had a miscarriage in her first pregnancy and another in her fifth. No history of syphilis was obtained. Past History—The baby was probably premature, weighing about three pounds at birth, June 3, 1920. Normal labor. He has been breast-fed since birth at 2½-hour intervals. He is said to have had a hernia since birth. Present Illness—Two weeks ago baby had a severe crying spell, during which mother noticed baby was somewhat blue. Following this, his breathing became labored, "heavy," and this difficult, rapid respiration has been more or less persistent since that time. The mother has noticed the cyanosis—"blueness"—at intervals ever since the baby's birth, but merely thought that the baby was cold. The attack two weeks ago was sudden in onset and more severe than the earlier ones. There has been no marked cyanosis since. Three doctors saw the baby and diagnosticated the condition variously as a leaky valve, a cold on the chest, and stomach and bowel disorder. The mother was not satisfied and finally came to The Boston Floating Hospital. The chief complaints are the peculiar breathing, the cyanosis and an appearance of prostration. There has been no fever, no vomiting, no diarrhea (3-5 yellowish, smooth stools a day). Appetite good; seems satisfied after nursing. He sleeps poorly and is very restless; at times he has seemed prostrated; has had no convulsions; has difficulty in breathing, and has had a slight cough, but no nasal discharge.

Physical Examination—A small, fairly well nourished infant, extremely dyspnoeic, somewhat prostrated and slightly cyanosed generally. The skin is dry. Reflexes—Normal. Pupils equal and react to light. Neck not stiff. No Kernig, ankle clonus or Babinski. Knee-jerks normal. Head—Fontanelle slightly depressed; measures 4½ x 5 cm. Eyes, ears, nose and throat are negative, except the tonsils are hypertrophied. Thorax—Normal in shape; no evidence of rachitis. Heart—The apex beat is at the nipple, has fair force, a rate of 140, and marked sinus arrythmia. A2 is greater than P2. There is a systolic murmur over the base transmitted to the back. Lungs—Both lungs are hyper-resonant. d'Espine sign to third thoracic vertebra. There are no râles and the breath sounds are normal. Abdomen —The liver edge is palpable, 1 cm. below costal margin. There is an inguinal hernia present on each side, admitting the tip of the little finger, and having a definite impulse.

Clinical Diagnosis—(?) Thymus. (?) Congenital heart. Bilateral inguinal hernia. Anhydremia.

Laboratory Data: Urine — Acid, cloudy, large trace of albumin, no sugar or acetone. Sediment was negative in the only specimen obtained. Stool—Acid, aromatic, few small fat curds; no fatty acids, soaps or starch. Blood Hemoglobin, 55%; white cells, 18,000; red cells, 2,400,000. Differential Count — Polymorphs, 57%; lymphocytes, 38%; transitionals, 5%. Smear:—Marked anisocytosis, poikilocytosis and achromia. Von Pirquet—Negative. Wassermann—Negative (post mortem)

Subsequent History: Admitted with subnormal temperature and marked dyspnoea. Put in premature jacket, given caffein gr. ¼ in brandy M VIII subcutaneously q. 3 hr. p. r. n. as pulse was very poor. Took food well first night. Had almost continuous convulsions the next day and food had to be given with tube. Condition about the same for next 24 hours, when he suddenly went bad and stopped breathing. Discharged, dead, August 6, 1920.

Pathological Report: Body—The body is that of a well developed and well nourished infant measuring 51 cm. in length. The skin is clear. There is a moderate post-mortem lividity. There is a moderate layer of subcutaneous fat which is somewhat oedematous, especially in the dependent portions and pits slightly on pressure. The inguinal rings on each side admit the tip of the little finger and are obviously potential herniae. Peritoneal Cavity — The peritoneal cavity contains about 50 c.c. of pale straw-colored fluid which smells strongly of urine. There is no other evidence of peritonitis. The sigmoid is redundant with a complete extra loop, which is free, floating on the fluid in the abdomen. The colon is tremendously dilated as far as the sigmoid, where it becomes sharply constricted, remaining so through the rest of its length. The ileum shows two small diverticuli about midway. These measure over 2 cm. in length and 0.5 cm. in diameter. A striking feature of the abdominal contents is the dilated ureters which are easily confused in appearance with the ileum. These will be described in greater detail later. Lungs—Pleural and pericardial cavities show no abnormalities. Both lungs show a moderate hypostatic congestion. There is a recent terminal broncho-pneumonia present in the right base, of not over 24 hours' duration. (This condition, while a contributing factor in causing death, has no bearing on the discussion and can be dismissed at once, therefore). Heart—Weighs 19 gms. It is a normal appearing organ externally, small and contracted. On opening the auricles, however, there is seen a widely patent foramen ovale with no suggestion of a closing membrane. The ductus arteriosus is likewise patent. The other common cardiac defects are not present in this heart, however,—pulmonic stenosis and patent interventricular septum. Abdomen —The gastrointestinal tract, beyond the congenital abnormalities already noted, is normal. The liver, spleen, pancreas, gall-bladder and ducts show no gross pathology. The suprarenal capsules are normal in size. They appear relatively hypertrophied because of the diminutive size of the kidneys which they overlie and nearly obscure.

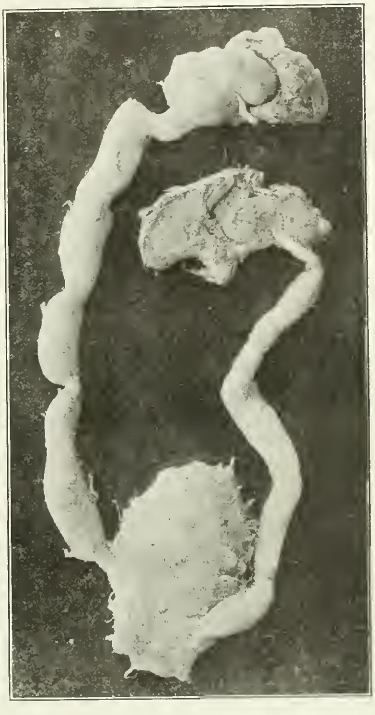

Plate I.—Posterior view of bladder, ureters, kidneys and suprarenal glands. Two-thirds actual size.

Genito-Urinary Tract: Kidneys—The kidneys are small, weighing about 7 gms. together (they were not separated from the ureters, so the absolute weight cannot be given). Their capsules are thin, filmy, fibrous affairs which strip very easily. The surface of each kidney is studded with several small, thin-walled, bleblike cysts varying in size from 1.0 mm. to 6.0 mm. On section, the kidney parenchyma contains likewise innumerable small cysts,—chiefly in the cortical region. The normal architecture of the kidney can be made out readily, however, and the normal relation of cortex to medulla persists. The calyces and pyramids are somewhat distorted, especially in the left kidney. The pelvis of the left kidney is markedly dilated and the picture is definitely one of hydronephrosis. In the case of the right kidney, however, this condition is much less marked,—there being a constriction of the ureter with considerable thickening of its muscular coat for a distance of 1 cm. below the pelvis, which is itself but very slightly dilated. Ureters—The ureters present a twisted, thickened, distended appearance with several constricting fibrous bands, especially along the course of the left ureter. They measure in diameter approximately 1 cm. on the average, in places exceeding this by nearly as much again. The left one presents a fibrous constriction at the point of entry into the bladder wall, and the lumen of the ureter at this point will admit only the finest probe. This constriction is not so marked in the case of the right ureter. Bladder—The bladder shows marked hypertrophy of its walls with a thickening of its mucous membranes. This is the only pathological feature noted in regard to this organ. Prostate and Urethra—There is marked constriction in the lumen of the urethra in its prostatic portion. This will not admit the finest probe. There is obviously a congenital stricture of the urethra at this point. This suggests a mechanical cause for the pathology of the genito-urinary tract. Testes—The right testis is normal in size and appearance. The epididymis on this side occurs apparently as a separate organ superimposed upon the testes and connected with it only by a fibrous cord containing a duct. The left testis is not descended and is found just above the internal inguinal ring. It is distinctly smaller than that of the right side. The epididymis of this side appears similarly diminutive but normal otherwise. The ducti deferentes are somewhat thickened.

Microscopic Examination—The microscopic examination of the tissues contributes nothing additional of interest or of value in discussing the case, and will therefore be omitted.

### DISCUSSION.

As I have said in introduction, the interest in this case is in its multiplicity of congenital anomalies. These include:

1. Congenital cystic kidneys and hydronephrosis.
2. Congenital hydropic ureters.
3. Congenital hypertrophy of bladder.
4. Congenital stricture of the urethra.
5. Congenital undescended testicle (left).
6. Congenital abnormality of epididymis (right).
7. Congenital bilateral inguinal herniae.
8. Congenital diverticula of ileum.
9. Congenital redundancy of sigmoid.
10. Congenital heart.
    - *a.* Patent foramen ovale.
    - *b.* Patent ductus arteriosus.

In discussing the case, the only point I wish to make is that which was raised at the time of the autopsy, of the possible mechanical origin of the hydro-ureters and hydronephrosis because of the urethral stricture. There does not seem to me sufficient evidence that this condition is merely a damming back of the kidney products, for mechanics alone would explain with difficulty the diminutive size of the kidneys and the fibrous bands around the ureters of the trigone on the left and at the pelvis of the kidney on the right. It seems much more readily explained by considering the several features of the case as all due to congenital defects.

That such an imposing array of defects should occur in an individual seems sufficiently unusual to warrant the reporting of the case.

## Book Review.

*Medical Service in Modern War.* LIEUTENANT-COLONELS P. S. BOND and C. F. MARTIN, U.S.A. Wisconsin: George Banta Publishing Company. 1920.

"Medical Service in Modern War" presents a well-arranged and coördinated account of the functions and practice of our Medical Department during the World War. The forty thousand American physicians and surgeons who served in the United States Army had little conception, on entering service, of the methods employed by the Medical Department for the conservation of man power in war time; in the interest of National Defense, every physician should be familiar with the information on this subject contained in this book. The authors have outlined briefly the facts which the medical service should understand about army organization, and have described in detail the general functions of the Medical Department, medical equipment of division, corps, and army, methods of managing the evacuation and treatment of sick and wounded, and medical service in open warfare. As the book is based on the experiences of the Medical Department during the war, it is practical, and indispensible to those who might be called upon to serve in the capacity of medical officers in time of need. A summary of health and casualty statistics of the World War is included in the Appendix.

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## OBITER DICTA.

It is with great regret that the retiring editor relinquishes his duties in connection with the Boston Medical and Surgical Journal, with whose editorial staff he has been associated since 1909. He had earnestly hoped that this association might continue, and that he might remain in charge of the Journal until its centennial, in February, 1928.

Next to the *Lancet*, the Journal is the oldest weekly medical publication in English. For nearly a century, under private ownership, it has fearlessly, consistently, and independently endeavored to represent and maintain the best opinion and standards of the medical profession, not only in Boston, but in New England. When, in 1914, the first affiliation with the Massachusetts Medical Society was formed, it was intended that this representation should become more complete and effective. Now that the ownership of the Journal is to be transferred to the Society, it is expected that the Journal will even more fully and satisfactorily express the opinions and purposes of the rank and file of the profession.

The Boston Medical and Surgical Journal has had an honorable and distinguished history. Its principles are progressive. For its future, the retiring editor hopefully desires a continuance of the spirit which has animated its traditions; and for those to whom its conduct is entrusted, he cordially wishes the fullest measure of prosperous achievement. Finally, he leaves his sincerest and most grateful appreciation to those whose single-hearted fidelity and devoted assistance, during the past years, not only have made possible the conduct of his administration, but have rendered his experience with the Journal one of the happiest of an unusually fortunate life. *Quod bene felix faustumque sit.*

## COMMITTEE ON RURAL HEALTH AND MEDICAL SERVICE.

New agencies are now at work to promote rural health. There should be recognized at the start, a natural affiliation with the older agencies so long and so vitally associated with health matters in the past, and the need of soliciting cordial coöperation from these. The following committee on rural health and medical service has, therefore, been recently formed:

President, K. L. Butterfield, Massachusetts Agricultural College, Amherst; Arthur W. Gilbert, Commissioner of Agriculture; Dr. E. R. Kelley, State Commissioner of Health; Dr. E. H. Bigelow, Public Health Commissioner of the Massachusetts Medical Society; Mrs. W. L. Putnam, Boston; Dr. P. W. Goldsburg, Deerfield, Mass.

The city trend, the hospital and clinical developments in the large centres, are facts which the doctor in the rural districts has to face more and more. He has been, and is, put to a great and growing disadvantage. The old-time doctor, by reason of his special training and breadth of experience, has been able to hold a position of unusual influence and power in the communities in which he has labored. His work has been of such a confining nature, his life so drawn upon to maintain the vitality of that community environment, where so much has been expected of him, that in all justice, the vantage of his professional heritage and its highest functioning under present conditions, demands a more appreciative and intelligent consideration and protection. We desire, therefore, to encourage such measures as will insure his enlistment in the newer advances, and make use of his accumulated knowledge and experience in respect to his own fields. We desire, also, to further those means to bring within practical reach, hospital and clinical facilities, and the educational methods for keeping abreast of the times, all of which are so essential to individual efficiency and community welfare.

We, therefore, endorse this special endeavor to promote a better understanding and coöperation of agencies, new and old, which must serve life and welfare in the back districts, and ask the support necessary to carry along this work.

## LEGISLATIVE STATUS OF ANTI-VACCINATION IN MASSACHUSETTS.

The endorsement of the anti-vaccination bill by the Senate is disquieting, especially at this time, because of the presence of smallpox in the city of Boston.

The proponents of the bill have carried on an active campaign of several years, which has, apparently, confused the minds of some of the legislators. The House has been the bulwark of defense.

Physicians should understand that the education of the people should not be left to the work of the committee on legislation at hearings before the Public Health Committee of the legislature, for under the stress of controversy, it is difficult to secure judicial treatment of a subject. The people should be educated by physicians and made to understand that the great weight of medical opinion is in favor of the protective power of vaccination. The Senate vote is published for the information of physicians throughout the State.

In favor of removing the compulsory vaccination system as applied to public schools:

Yes—Butler, Carey, Carrick, Churchill, Cooke, Dahlborg, Donovan, Emery, Englert, Gould, Green, Griswold, Halliwell, McLane, Moulton, Nelson, Quinn, Tarbell, Wadleigh and Wright. Total, 20.

No—Babb, Casassa, Chamberlain, Clark, Gibbs, L. F. Hardy, W. A. Hardy, McDonnell, Monk, Naphen, Parkhurst, Pearson, Putnam, Reed, Trefry. Total, 15.

Paired—Yes, Shea; no, Wells.

Opponents of the measure are confident it will meet defeat in the House, as in other years.

On Thursday, April 7, the House of Representatives overwhelmingly reversed the action of the Senate and defeated the bill by a vote of more than a hundred to twenty. The people are under obligation to the House for this expression of confidence in the arguments of physicians. The State is to be congratulated on having several well qualified physicians in the House.

Perhaps the Senators who voted for this bill may, at some time, inspect a case of smallpox and study the whole question, away from the influences which were actively at work in the lobby.

In Honor of Mme. Curie.—The June issue of the *Medical Review of Reviews* will be a special radium number, dedicated to Mme. Curie. The issue will consist exclusively of articles on radium and its uses, written by the most prominent radiologists in the United States and Canada.

Copies will be sent, complimentary, to every physician interested in the uses of radium, and any readers of this item who desire that issue may have it by asking for it from the Medical Review of Reviews, 51 East 59th Street, New York.

## THE DANGER OF TYPHUS FEVER.

The unsettled conditions in Europe, together with the vast number of immigrants coming to this country, have increased the likelihood of typhus fever infection being introduced into this state. The Massachusetts Department of Public Health, therefore, wishes to call this fact to the attention of the medical profession of Massachusetts and to urge that special care be exercised in the diagnosis and differentiation of exanthematous conditions of newly arrived immigrants or their associates.

Typhus fever is an acute, febrile, specific, infectious disease, with characteristic macular, often hemorrhagic, exanthem and accompanied with severe nervous and mental symptoms. The incubation period is from five to twenty days,—average, twelve days. Onset is usually sudden, with chill, fever, headache, myalgia, severe prostration, tachycardia, coated tongue, suffusion of face and eyes, mental dullness, delirium and vomiting. The exanthem appears on the fourth or fifth day, on the lower abdomen and shoulders; later, upon the chest, back, and upper abdomen, and last, upon face and extremities. The whole rash appears within two or three days and lasts from a few days to a week or more. The rash consists of pale red spots, varying in size from a pinhead to a small pea, being macular. After a few days it assumes a dirty red color and ceases to disappear upon pressure. Some spots become definitely hemorrhagic. The fever rises suddenly, with only slight remissions. Defervescence occurs at the end of the second week, generally by rapid lysis, becoming subnormal in twelve to twenty-four hours. There is usually a slight leucocytosis, 12-15,000.

The disease should be differentiated from typhoid fever, smallpox, epidemic cerebrospinal meningitis (spotted fever), and measles. It is transmitted exclusively by the bite of body or head lice, and the prevention lies in cleanliness. There is no possible danger of a typhus epidemic or typhus outbreak in a deloused, cleanly community.

The Department of Public Health will be glad to assist in the diagnosis of any questionable case.

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## ENCEPHALITIS LETHARGICA.

Encephalitis Lethargica appeared in Austria in 1916, in England in early 1918, and in the United States in the winter of 1918-1919. It is popularly spoken of as the "sleeping sickness," because an important symptom of it has often been lethargy and sometimes deep coma. The name, "sleeping sickness," however, has already been preëmpted for another disease, "African trypanosomiasis," which also, and more particularly, is characterized by sleep or coma.

The Department of Public Health of Massachusetts, on April 5, 1919, requested voluntary reporting of this disease by physicians and boards of health, and at a meeting of the Public Health Council held February 8, 1921, encephalitis lethargica was declared to be a disease dangerous to the public health and as such reportable under the provisions of Sections 7, 109, 111 and 112 of Chapter 111 of the General Laws. This action was taken because of the present unusual prevalence of the disease which was brought to light by a recent investigation by the Department. The principal reason for making the disease reportable was in order to facilitate the gathering of information about it, and in taking this action the Council did not feel that present knowledge justifies any restrictive measures, such as special quarantine and exclusion from general hospitals.

To February 1, 1921, the Department of Public Health had records of 75 cases; 33 were prior to January 1, 1921, and 42 occurred during January, 1921. Based on these cases, and more especially on the literature, observations have been made on the present status of our knowledge of the disease. The etiology of encephalitis lethargica is not known. Some investigators claims that, like poliomyelitis, it is due to a filterable virus, but these claims have not been corroborated, the ideas that it might be due to food poisoning, notably botulism, or was a sequela of influenza, have both been discarded as disproved. The investigation of January cases did not point to either of these factors.

Pathologically, encephalitis lethargica is a perivascular infiltration of mononuclear cells and an edema about the blood vessels in the encephalon. Sometimes small hemorrhages occur. The structures particularly mentioned as affected have been the optic thalamus, the third and lateral ventricles, the aqueduct of Silvius, the pons, the medulla, etc. The cord is occasionally also affected to some extent. The hospital cases investigated have given histories of spinal fluid cell counts averaging from 15 to 50 cells, generally mononuclear in character. Where there was a high count, some polymorphonuclears were noted.

The general symptoms of the disease are general irritability, nervousness, sleeplessness, headache, loss of appetite, and nausea. A low grade fever is often seen. As the case progresses, lethargy, mental depression, drowsiness and somnolence very commonly appear; but the very opposite has been noted, as excitability and even delirium and mania. Among the localizing signs, diplopia and ptosis are exceedingly common. Other symptoms of a localizing nature are numerous, as, facial paralysis, polyneuritic symptoms, blurred vision, vertigo, tremors, twitchings, muscular pains, and weakness.

The fatality rate of encephalitis lethargica has been variously stated at from 15 to 40 per cent. Of the 28 hospital cases of the series of January cases studied by the Department, there were ten deaths, giving a fatality rate of 35 per cent. The very fact of hospitalization in these cases would seem to indicate that they were of a severe type. It is probable that many mild cases of the disease exist, and that when these, as well as the severe types, are diagnosticated, the fatality rate will be much less than above indicated.

Of the 33 Massachusetts cases prior to January 1, 1921, in only five instances did the facts stated on the histories fully justify the diagnoses. Of the 42 January cases, 28 were in hospitals, and in only one or two instances was there any doubt whatever of the diagnosis. Of the first 33 cases reported, five were children and 28 adults. All the January cases were adults.

From this study, though, on account of the small number of cases, they cannot be conclusive, the following observations are made:

1. As it has occurred in Massachusetts, the incidence has been a winter time incidence.

2. Adults have been far more commonly affected than children.

3. There was generally no recent acute illness within a reasonable period prior to the onset of these cases.

4. No single, authenticated instance has been found suggesting that the disease is directly contagious, such as grouping of cases or multiple cases in a family.

5. There is now in the minds of the profession a well defined picture of what is to be diagnosticated as encephalitis lethargica, which was not true in 1918-1919.

6. A well defined impression exists among neurologists and clinicians that the disease may increase in prevalence in future years.

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## MEDICAL NOTES.

Belgian Medical Students in America.—Medicine is a popular subject with the exchange students of the Commission for Relief in Belgium Educational Foundation, for out of a total of twenty-four Belgian students at work in American universities, ten are devoted to the science of medicine.

Five come from Brussels University, two from Louvain, two from Leige, and one from Ghent. They are now studying in Johns Hopkins, California, Harvard, Columbia, University of Pennsylvania, Cornell, Yale, and Stanford, and are specializing in stomatology, neurology, bacteriology, ophthalmology, and surgery.

These and fourteen other Belgian students are studying in American universities as fellows under the C. R. B. Educational Foundation, which with the parallel organization in Belgium, the *Foundation Universitaire*, provides for the exchange of forty-eight graduate students yearly between America and Belgium, twenty-four from each country. Loans are also arranged for undergraduates in Belgium who are unable otherwise to get university training. About 2,000 students will benefit yearly under the Foundation. Some provision was also made for the rehabilitation of Belgian universities wrecked during the war.

Medical Appointments in the U. S. Navy.—There is at present a large number of vacancies in the Medical Corps of the Navy, and examinations are being held at frequent intervals in several of the coast cities in the United States, both on the east coast and the west coast, and also at Chicago, Ill. For the present, appointments will be made directly into the Medical Corps of the Navy instead of by preliminary enrollment in the Naval Reserve Force.

The physical requirements will remain the same, but the professional examination will be on the subjects of General Surgery, General Medicine, General Hygiene and Sanitation. There will also be a practical examination.

As a consequence of this change, successful candidates, who may be ordered in attendance upon a course of instruction at the Naval Medical School, will be given an examination upon completion of such course for the purpose of determining the value they have received from the course of instruction, but not with a view to determining their position in the regular service, this being accomplished by entrance examination.

The Bureau of Medicine and Surgery, Navy Department, Washington, D. C., will be pleased to furnish any further information to prospective candidates upon written inquiry to this Bureau.

Grants for Medical Research.—Among the grants for research made by the American Association for the Advancement of Science, are the following:

One hundred and fifty dollars to Professor Carl J. Wiggers, Western Reserve University, in continued support of his investigation to the physiology of the circulation.

One hundred and fifty dollars to Professor Frank A. Hartman, University of Buffalo, for aid in the study of suprarenal insufficiency, including circulatory, respiratory, temperature, and fatigue changes, as well as possible histological alterations in the ductless glands.

Two hundred dollars to Professor W. E. Garrey, Tulane University, for the purchase of apparatus for hydrogen ion determination.

One hundred and fifty dollars to Professor F P. Knowlton, Syracuse University, in support of a study of the blood flow and gaseous metabolism in the thyroid gland.

Jefferson Medical College.—By the will of Daniel Baugh, a legacy of $150,000 has been left to the Jefferson Medical College of Philadelphia, to be used for the salary of the Professor of Anatomy and Director of the Daniel Baugh Institute of Anatomy and Biology.

American Funds for the German Medical Profession.—It has been recorded in the *Deutsche medizinische Wochenschrift* that Dr. Lange, of Chicago, has sent to Professor Paltauf, of Vienna, 7,000,000 crowns collected in America. It has been reported also that another sum of $10,000 has been forwarded from America to aid the university professors. The Rockefeller Foundation has also appropriated $60,000 for assistance to the Vienna clinics. This sum is said to be equivalent to 40,000,000 crowns at the present rate of exchange. The salaries of the regular university professors of Vienna increased materially last year, being 45,000 crowns, increasing by 4,000 crowns every fourth year to a maximum of 70,000. It has been reported in the *Münchener medizinische Wochenschrift* that Dr. A. Stein, chief of the Lenox Hill (formerly the German) Hospital, has recently sent a large sum collected in America to Frankfort-on-the-Main to be applied for scientific purposes.

Vaccine for Tuberculosis.—An article published in the *Petit Journal* indicates that progress has been made in the struggle of the medical profession to find a cure for tuberculosis. The experiments of Professor Calmette, sub-director of the Pasteur Institute, have been described and are of considerable interest. At the end of thirty-four months, when the animals were slaughtered, it was found that of four unvaccinated heifers, three showed advanced tuberculosis; of six unvaccinated beasts, the two which had only once been vaccinated showed distinct signs of the disease; but the four animals which had been been vaccinated three times, although they had been in constant company with the tuberculous companions for thirty-four months, showed no trace of the disease. Further experiments are now being made.

To find out whether this vaccine can be applied successfully to man, experiments will be necessary on chimpanzees and anthropoid apes. As these animals do not take kindly to temperate climates, Professor Calmette and his collaborators have decided to build an experimental laboratory in French Guinea. The Pasteur Institute has obtained the concession of Rooma Island, four miles from Konakry, for their researches, and the Governor of Western Africa has put at the Institute's disposal from the 1921 budget, the sum of £6,000, with which the laboratories will be constructed. The researches of the scientific missions will take some years, and the estimated expenditure is £5,000 a year.

Appointment of Lecturers.—Dr. Herbert Spencer has been chosen to deliver the Harveian oration in London in October; Dr. Michael Grabham, of Madeira, will deliver the Bradshaw lecture in November; and Dr. Major Greenwood will deliver the Milroy lectures in 1922.

Committee for Rehabilitation Hospitals.—The following physicians have been chosen to be a committee to survey the country and locate the soldier rehabilitation hospitals provided for by recent legislation: Dr. William C. White, Pittsburgh, chairman; Dr. Frank S. Billings, Chicago; Dr. Pearce Bailey, New York, and Dr. W. G. Bowman, Pittsburgh.

Youth and Life.—"Youth and Life," the new exhibit of the U. S. Public Health Service, consists of 24 attractively illustrated cards, measuring 28 x 22 inches each. The exhibit, which is especially addressed to young women, is an appeal for physical fitness as the best aid to fulfilling the duties and enjoying the pleasures of life. The value of hygienic living and the need of plenty of exercise, fresh air, sleep, and proper food are emphasized. The function of the glands of the body, including the sex glands, are shown. Human reproduction is approached through a brief presentation of reproduction in plants and animals; and attention is called to the probable effects of sex misconduct (venereal diseases). Womanliness, motherhood, and home-making are extolled. This exhibit may be borrowed for special work from State boards of health or be purchased through the American Social Hygiene Association, New York City.

Reports on Non-Respectable Diseases.—An increase of about 30 per cent. in cases of venereal disease reported from all states except Nevada and the District of Columbia is shown in reports to the U. S. Public Health Service for the three months ending September 30. Seven states have laws requiring physicians to report all such cases with the names of the patient; and nearly all of the other states require them to be reported without names. The sudden jump in the number reported probably means, not that the diseases have increased, but that more physicians are obeying the law. Curiously enough, the reports indicate that physicians in western states are far more law abiding than those in the East. Massachusetts, for instance, with a population of 3,850,000, reports a good deal less than 3,000 cases, while Texas, with a population only one-fifth larger, reports more than 15,000 cases. Other western and eastern states show similar relations.

Medical Meetings in Cleveland.—The American Association of Pathologists and Bacteriologists, the American Society for Cancer Research, the American Society of Immunologists and the International Association of Medical Museums (American and Canadian Sections) held meetings in Cleveland from March 24 to 26.

Yale University Degrees.—Announcement has been made that the graduate school of Yale University has been authorized to confer the degree of Doctor of Philosophy for work in clinical medicine, and in pharmacology and toxicology.

State Care of Mental Defectives.—The different states are beginning to realize more and more, the perils that result from neglecting the complications that mental diseases introduce into the problems of delinquency, crime, dependency, and other social ills, and are adopting measures for the cure and prevention of these diseases. Particular attention is being given to preventive work among children, because they are likely to suffer from many small and easily remediable health defects which, if neglected, may heavily handicap them in later life.

Delaware is the latest state to take action. As a result of a two-year survey in Sussex County, following a similar survey in New Castle County, both made by the U. S. Public Health Survice, in collaboration with the Children's Bureau, the state officials engaged in the care of mental defectives have become intensely interested in the establishment of a bureau of mental hygiene in connection with the State Board of Charities, to deal with the subject.

At the request of the Secretary of the Board, the representative of the Public Health Service who had directed the original surveys, was sent to Delaware to outline a program for the institutional care and community supervision of the mental defectives, resident in the state.

First steps in carrying out this program have been taken by the appropriation by the legislature of $60,000 for improving the care and treatment of the mental patients in the State Hospital at Farnhurst. A training school for nurses specializing in neuropsychiatric diseases will be opened; reconstruction aides in both occupational and physico therapy will be engaged; additional physicians will be employed.

Vacant Beds in Public Health Hospitals.—Recent statements that the U. S. Public Health Service had 4,000 vacant beds in its hospitals while asking for more hospitals, has brought out the following reply from Surgeon-General Cumming:

"On February 19, the date of our last weekly report, about 2,200 beds were vacant in our hospitals. Of these, about 1,200 were "new" beds in hospitals just opened or in additions to older hospitals; none of them were really in full working order. This leaves about 1,000 vacant beds, or 6 per cent. of our total capacity of 17,394. This does not, of course, include our patients in rented beds in contract hospitals, who numbered 10,213.

"Six per cent. leeway is a frightfully narrow margin on which to run any hospital; for any day, any hour the hospital may be swamped by new patients. Particularly is this so in hospitals for soldier patients, a very large percentage of whom are continually asking for discharge or transfer to other hospitals, or leaving without formality. The turnover in our hospitals for the week was 2,274 admitted, and 1,785 discharged.

"The six per cent. does not, of course, refer to the same beds, or to beds in the same hospital, city, state, or even section of the country. Almost any of our hospitals may, and not infrequently does, run 20 per cent. below on one day and 10 per cent. over on the next—with the men sleeping in improvised beds till they can be transferred to other hospitals.

"The situation is made more difficult by the necessity of setting aside 20 out of our 56 hospitals for special troubles—12 for tuberculosis patients, 7 for neuropsychiatric patients, and one for epileptics. Such patients are, of course, not interchangeable.

Another difficulty arises from the lack of personnel, especially of nurses, the demand for whom is everywhere pressing. In spite of its utmost efforts, the Service has been unable to recruit its corps fast enough to keep pace with the increase in its patients; and it is now about three hundred short. Without nurses, a hospital cannot be efficiently conducted; and the Service is continually being forced, now in this hospital and now in that, to keep down the number of patients, or to render insufficient service to all.

"Similar shortages exist in the ranks of its reconstruction aides and its dietitians, all of whom, like its nurses, are women. Lack in these bodies, though not quite so vital, nevertheless, means much to the health and the comfort of the patients."

Child Health Demonstration. — Preliminary plans for a child health demonstration, unique in character and scope, and promising to prove of first importance in the general movement for conservation of child life and health, have been announced by the National Child Health Council, with headquarters in Washington, D. C. With an appropriation of $200,000 set aside for this purpose, the Council, composed of six leading national health bodies, will assist some American community of between 20,000 and 30,000 population, and the surrounding county, in securing as nearly as possible ideal conditions, for the development of its children, from babyhood to adolescence, into sturdy, happy, useful citizens.

The first step will be the selection by a committee of experts of the community in which the demonstration will be carried on over a period of five years. Geographical limitations are not imposed in the selection of the community, but the Council believes the following qualifications will insure that the results are of the greatest benefit to the entire country.

1. The town or city should be located in a county of between 50,000 and 60,000 population. The population should be fairly stable.

2. The age distribution of the population should be fairly near the average, especially as to the percentage of children and babies.

4. The city or town should have a normal percentage of its population engaged in manufacturing.

5. There should be a variety of industries in the city.

6. The surrounding area should be agricultural territory.

7. The town should be in a birth registration state, and should have fairly complete vital statistics.

8. The mortality of infants and children should not be strikingly abnormal. Health conditions should not be abnormally good or bad, and health machinery, including state laws, local ordinances and personnel, should be equal to those of a community of similar size.

The committee which will recommend the town to be chosen for the experiment consists of Dr. Richard A. Bolt of Baltimore, general director of the American Child Hygiene Association; Miss Ella Phillips Crandall of New York, formerly director of the National Organization for Public Health Nursing; Dr. Charles J. Hatfield of New York, director, National Tuberculosis Association; Owen R. Lovejoy of New York, general director, National Child Labor Committee; Miss Sally Lucas Jean of

New York, director, Child Health Organization; Dr. Haven Emerson, former health commissioner of New York, and Dr. Donald B. Armstrong, Framingham, Massachusetts.

The direction of this novel health experiment will be under Clarence King, who is widely known in the field of research and the administration of health and social work. He holds degrees from the University of Wisconsin and Columbia University.

Member societies of the National Health Council are: The American Child Hygiene Association, American Red Cross, Child Health Organization of America, National Child Labor Committee, National Organization for Public Health Nursing, and the National Tuberculosis Association.

NEW YORK ELECTROTHERAPEUTIC SOCIETY ORGANIZED.—At a meeting held at 30 West 44th street, on March 9, 1921, the New York Electrotherapeutic Society was organized, and the following officers elected: Dr. Victor C. Pedersen, President; Drs. Harold D. Corbusier, I. Seth Hirsch, Vice-Presidents; Dr. Herman C. Frauenthal, Treasurer; Dr. Richard Kovacs, Secretary; Drs. Frederic de Kraft, A. Bern Hirsh, William Benham Snow, Lucy Osborn Wight, Members of Executive Committee. Regular monthly meetings will be held on the first Wednesday of each month, to which all physicians interested in electrotherapeutics are welcome. The paper of the April meeting will be, "Practical Points in the Application of Diathermia," by Frederic de Kraft, M.D., followed by discussion.

## BOSTON AND MASSACHUSETTS.

AMERICAN MEDICAL ASSOCIATION IN BOSTON.—The Massachusetts Medical Society has invited the American Medical Association to hold its next meeting in Boston,—in June, 1921. The expense of this meeting, so far as the scientific program is concerned, is borne by the American Medical Association; but it is desirable for us to arrange for the comfort and entertainment of the members who are really our guests while in Boston. In order to provide proper hotel accommodations and entertainment for the visiting members and their families, a considerable sum of money is necessary It is expected that nearly 10,000 people will come to Boston in connection with this meeting, and it can readily be seen how great will be our expense.

In 1906, we set a very high standard as host to the American Medical Association, and it is hoped that we can duplicate our results, in spite of the necessary additional cost of entertainment.

A collection is being made from all members of the Massachusetts Medical Society, and the response from the districts outside of Suffolk and the help given by the medical profession in New England is very satisfactory. In addition, we expect considerable aid from the business houses in Boston.

In spite of this, a large deficit must be met, and the Committee on Finance is sending you this appeal in hopes that you will contribute at least five dollars to a cause which we consider most worthy. Should you feel that you can afford a larger contribution, it would be greatly appreciated by the various committees who are laboring, at present, under the handicap of insufficient funds.

Checks should be made out to Dr. Hugh Williams, Treasurer, and sent as promptly as possible to Dr. Lesley H. Spooner, 520 Commonwealth Avenue, Boston.

For the Committee on Finance,

HUGH WILLIAMS, *Chairman.*

THE BOSTON LYING-IN HOSPITAL.—There were admitted to the Boston Lying-In Hospital during 1920, 1,123 patients. About one-fifth were free cases; the balance paid less than one-half of the cost of their care. These patients, in the main, represent a fine type of hard-working, self-respecting women, practically all of whom are married; 977 babies were born and cared for.

In the Out-Patient Department, 7,488 visits were made to pregnancy clinics by 2,799 patients. These patients were supervised in the various clinics by obstetricians and nurses. They also have the advantages of the home supervision of the district nurses and medical-social service nurses. Any abnormal condition, or need of material aid or advice is thus early recognized and the proper remedy provided. 1,225 patients were attended at confinement in their homes, involving about 12,600 visits by attending house officers and externes. 1,251 babies were born and cared for.

Eight house physicians were given six months' intensive obstetrical training; 210 medical students or graduates were given special training; 66 nurses, with special obstetrical training, were graduated.

During the last 48 years, 27,962 patients were treated in confinement in the Hospital; 27,133 babies were born or cared for in the Hospital; 52,283 patients were attended in their homes; 51,850 babies were born or cared for in homes; 877 nurses were granted diplomas; 283 house officers were granted diplomas; 5,063 medical students were given special training.

The American Proctologic Society.—The American Proctologic Society will hold its twenty-second annual meeting at Boston, Massachusetts, June 3, 4, and 6, 1921. The profession is cordially invited to attend the public sessions. The Society will have its meeting place at the Boston Public Library, and its headquarters at the Hotel Braemore. Clinics will be announced later. The Committee of Arrangements includes Dr. T. Chittenden Hill, Dr. William A. Rolfe and Dr. Ralph Jackson.

Lethargic Encephalitis in Boston and Massachusetts.—Thirty cases of lethargic encephalitis have been reported to the State Department of Health, during the period from March 1 to March 19, and are now under observation by the State's experts. The number of deaths is not yet known, but, as the mortality rate is from fifteen to forty per cent., it is feared that the number will be higher in March than at any other time since the disease appeared.

Of the new cases, ten are in Boston, two of which are outside patients brought to Boston hospitals for treatment. Two cases were reported from Everett, two from Springfield, and one each from Melrose, Douglas, Newton, Wakefield, Holyoke, Webster, Winchendon, Newburyport, Braintree, Quincy, Fall River, Cambridge, Newbury, Lowell and Adams.

Despite the increased number of cases of the disease, little is yet known of it by the health authorities. The Public Health Council in February decided that the disease was dangerous to the public health, and ordered that, beginning March 1, all cases should be reported to the State Department of Health. Dr. Bernard W. Carey, deputy commissioner of health and director of the division of communicable diseases, sent pamphlets to every doctor in the State, giving such information as has been compiled concerning the disease. Prior to February 1, seventy-five cases were reported in Massachusetts, forty-two of which were discovered in January.

The cause of the disease is not known definitely, although several theories have been advanced. A study of the symptoms shows that the disease is accompanied by general irritability, nervousness, sleeplessness, headache, loss of appetite, and nausea in the early stages. As the case progresses, lethargy, mental depression, drowsiness and somnolence appear.

The localizing signs of the disease are double vision, drooping of the eyelids, facial paralysis, polyneuritic symptoms, blurred vision, vertigo, tremors, twitchings, muscular pains and weakness. The disease is more common among adults than children, and is not directly contagious.

Rejection of Maternity Benefit Bills.—As a result of reports made by the Committee on Public Health and Social Welfare, which have been investigating maternity benefit legislation, it has been decided that no action will be taken at present by the Legislature in this matter. The bill offered by Miss Edna Laurence Spencer was rejected unanimously. The bill recommended by the special commission appointed to investigate the subject was rejected, with dissension from Representatives Webster, Wright, Healey and Cooksey, of the Committee on Social Welfare, and Representatives Bartlett and Tyder of the Committee on Public Health. There is still before the committee a bill providing for an appropriation of thirty-five thousand dollars to be used in educating mothers and district nurses in maternity care.

Removal of Dr. Brough.—Seventeen prominent physicians, including Dr. Alfred Worcester, President of the Massachusetts Medical Society, visited Mayor Peters on March 21, to protest against the removal from office of Dr. David D. Brough, deputy in charge of the medical Division of the Health Department, by Dr. Woodward, Health Commissioner.

Week's Death Rate in Boston.—During the week ending April 2, 1921, the number of deaths reported was 228 against 209 last year, with a rate of 15.69 against 13.48 last year. There were 36 deaths under one year of age against 38 last year.

The number of cases of principal reportable diseases were: Diphtheria, 75; scarlet fever, 56; measles, 155; whooping cough, 28; typhoid fever, 2; tuberculosis, 43.

Included in the above, were the following cases of non-residents: Diphtheria, 6; scarlet fever, 1; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 5; scarlet fever, 3; whooping cough, 1; typhoid fever, 1; tuberculosis, 14.

Included in the above, were the following cases of non-residents: Diphtheria, 2; scarlet fever, 2.

**Smallpox Warning to the Medical Profession.**—There have occurred recently, in Boston, a considerable number of exposures to infection by smallpox among persons who cannot now be traced by the Health Department, many of whom are ignorant of their exposure to smallpox and some of whom may apply to you for treatment. Inasmuch as early and prompt diagnosis of doubtful cases may be facilitated by a knowledge of the possibility of exposures to smallpox, this information is transmitted to you.

These exposures originated in the case of one John Handrahan, residing in the South End, and most of the exposures occurred in the South End and Roxbury, although not all of them. Mr. Handrahan states that he has not been out of Boston for some time, and it, therefore, must be presumed that he contracted the disease in this city, indicating the presence of an earlier focus of infection here.

The onset of Mr. Handrahan's case occurred on March 18, but the nature of the malady was not recognized until the 30th ultimo, when it was brought to the attention of the Health Department. No precautions were taken in the interval, the patient even attending church while in the eruptive stage. Secondary cases may, therefore, begin to develop about April 1st and continue to develop until the middle of April. From now on, therefore, there is a possibility that any person suffering from an acute malady not definitely diagnosed, may be suffering from smallpox. This should be borne in mind.

The experience of the Health Department shows that smallpox, in the preëruptive stage, is likely to be mistaken for influenza or, possibly, for rheumatism, with the result that nothing is done for the protection of others until the eruption has been out several days. During the eruptive stage, confusion is most likely to occur with chicken-pox and certain of the eruptions of syphilis.

Coöperation in the present situation is requested. The Health Department will be glad to assist in the way of making diagnosis in any doubtful case; but when doubt arises, isolation of the patient and vaccination of contacts should be put into effect at once, without waiting for the Health Department or for a positive diagnosis.

## Correspondence.

### PUBLIC HEALTH AND THE RURAL PRACTITIONER.

Deerfield, Mass., March 28, 1921.

*Mr. Editor:—*

After an interval of some ten years of living back in the country, I returned recently to the city to do some work in the out-patient departments of large metropolitan hospitals with which I had formerly had some connection. Aside from the general growth and expansion of these hospitals from increase of number of patients attending clinics and the extension of specialized practice, there were two outstanding facts which struck me with more or less significance: the more general recognition by the medical profession of the hospital as an educational force with which they must keep in contact by reason of the fact that a larger percentage of doctors in the metropolitan area had some form of connection with it, and the marked development in the nursing and social welfare agencies. This latter fact seemed to me to manifest some symptoms that were ominous to the future welfare of the medical profession. I recall the attitude of a supervising social service worker who had a diagnosis of a case which clashed with that of the doctor, therefore she felt she had such a superior knowledge of the case that his diagnosis, of course, was wrong. I soon found that there were others criticising such growing assumptions on the part of nurses and other workers.

One who has looked over the statistics of the attendance of the medical schools during the past 40 years, must have been impressed by the decreasing numbers entering the medical profession. We realize, of course, the encroachments of Christian Science, osteopathic and chiropractic practitioners, but do we realize the advance of the graduate nurse and the social service workers and where they are effectually eliminating the standing of the medical man? As there have been encroachments upon religious practices, theories and dogmas handed down from the past, so there have been, and must necessarily be, into the field and habits of the medical profession a like kind of invasion. Religious creeds have very poorly stood the strain of "modern" progress, and less obviously, perhaps, has past medical practice and usage stood the strain.

In medicine the advance of scientific procedure, the discovery of bacteria and antitoxins has spurred on specialization, but has put a great tax on general practice and is rapidly promoting the disappearance of the "old family doctor." The general practitioner, out away from the large hospitals, finds it difficult to orient himself to all that is new coming into his field, and there is a tendency to revert, in many things, back to what he was taught 10 or 20 years ago. Now the nurse and social welfare worker, belonging as they do to a newer profession, are apt to keep more in touch with the hospitals, shift around more, and knowing, too, the men just out and beginning practice, do not appreciate, always, the maturity of the older men and too often regard them as old fogies. This accounts for part of their assumptions

The feminine quality of wanting something new and a change, does not always stop to reason as to the soundness of what has previously been done and practiced. Women have their part in insisting upon progress and must be given credit for it. Their work, however, is supplemental to that of men. Woman must be, as she always has been, a coöperative worker with man. She can never supplant him.

Woman has come into the field very effectively in matters relating to public health promotion, district visiting and social welfare. She is a nurse by nature, and the backbone of the hospital, but how well she fits as a diagnostician, or into the rôle of general or special practitioner, may be open to question. The fact remains that she is advancing materially the field and opportunities of medical service. The city and large towns have had, for the most part, the benefit of these new professions. The doctor and medical man has been gradually sucked away from the rural districts and small towns by the lure of hospital attractions, clinical facilities and education, and because he appreciated the value of trained women workers in the field. The problem of medical service in the back country grows more and more serious. I wish to quote from a recent letter:

"Franklin County Farm Bureau,
"Greenfield, Mass., March 11, 1921.

"Dr. Paul W. Goldsbury,

Dear sir:—

"In thinking over the matter of health in our rural communities, I have become more and more impressed with the great loss which has come to them in the disappearance of the old country doctor. He practically no longer exists in this county. Formerly, he was a tower of strength in the community, being interested in everyone from birth to the grave, and was not only a counselor in health, but an adviser in education and community policies. The fact that many of the people of the country towns are many miles from a physician and that our town physicians dislike to go long distances in adverse weather conditions when most needed, operates to shut them away from medical service in many cases.

"The net result is that the average country community does not have as good medical services as it did 50 years ago, while other classes are receiving superior advantages. The examination of country boys during the draft period showed the result of this condition, a condition for which the country community is not to blame. As there seems to be very little chance that young doctors will settle in country districts, so long as there is a chance of practicing in the centres, there seems to be no hope for improved conditions from this source and we must look to some organization, or movement, to give the opportunity for such medical attendance as is needed in the country districts. This problem is one which has a great influence on the future development of our agriculture, and one in which Franklin County Extension Service for Agriculture and Home Making is much interested and willing to coöperate.

"Yours very truly,
"J. W. Putnam,
"County Agent of Extension Service of Mass. Agricultural College and of U. S. Dept. of Agriculture."

Various organizations are seeking to extend district nursing service and social welfare work into rural districts. That will be a mobilizing of such agencies over the hills and into the back regions. The question of distribution of health centres is being agitated so that distances to clinics for specialized treatment, as in the case of tubercular and venereal diseases, will not be so great and so costly. The writer believes that hospital and clinical educational facilities should be within 20 miles of every general practitioner, and that provisions should be made so that he can get to such, at least once a week. The writer also believes that such health centers and the best kind of coöperation from physicians cannot be brought into being by mere legislative enactment, organization and financial support. The program and survey which can be adapted to the city and large town fits almost not at all to the rural district and each district has such a distinctive topography and individuality that standardizing makes a ticklish or precarious foundaton and framework. Rural life in this part of the country is an unknown book, essentially, to the welfare worker and district nurse. They have not lived back there enough to know and sense elemental conditions, the temperament and prejudices of the people, history and character of the land, etc., etc. The present rural practitioner holds the key to the initial development of a public health program for this back region and he must be sought out and his influence brought to bear for any permanent plan of upbuilding. A real appreciation of what he was in the past and a faith in his capacity to help solve present and future problems must be fundamental to anything effective and permanent.

Sincerely,
Paul W. Goldsbury, M.D.

## NOTE ON CHRONIC FUNCTIONAL DISORDERS.

1069 Boylston St, Boston, Mass.,
5 April, 1921

*Mr. Editor:—*

The following note is submitted to the attention of the profession, not as containing anything new or original, but merely by way of emphasizing certain practical points which deserve more attention from physicians than it is customary to give them.

Disease is fundamentally a condition of maladjustment of the individual to his environment. "Organic disease" is a condition of maladjustment in which tissue destruction has taken place. "Nervous, functional and mental diseases" are conditions of maladjustment without tissue destruction.

Symptoms arise from the attempt at readjustment or adaptation on the part of the individual. To say that symptoms are nervous or mental in origin is to say that the condition of maladjustment is not such as to be accompanied by tissue destruction. Properly speaking, all symptoms are nervous and mental, for they, in themselves, are evidence of nerve irritation, and they exist in the field of consciousness.

Chronic ill-health, with or without evidence of organic disease, is evidence of *failure* of readjustment or adaptation on the part of the patient. The failure of adaptation brings the patient to consult the physician, and the patient has a right to expect that the physician will be able and willing to point out why and how the attempt at adaptation has failed. Here is where we physicians have been woefully blind to our opportunities and our duties. And the patients realize it more keenly than the physician, when they are told that their condition is a functional disturbance, and they are sent on their way with a prescription for a tonic or a sedative.

Can we not realize more often that chronic functional disturbances are usually accompanied by depletion and waste of nervous energy through faulty hygienic habits? In order to help the patient make his readjustment or adaptation, we must ascertain the method by which the waste is taking place, and replace the faulty habits (physical and mental) by giving instruction how to build nervous energy through correct living.

W. G. Webber, M.D.

## PSYCHOBIOLOGY AND BIOPRAXIS.

425 Harvard Avenue, Claremont, California,
25 March, 1921.

*Mr. Editor:*—

*In re.* the editorial in the Journal, March 10, 1921, on name for the application to real life of a psychology, I have the honor to suggest the word "biopraxis" (the conscious self-control of conduct of each person) as being more to the case than "psychobiology."

Respectfully,
Franklin Bache Stephenson, M.D., U.S.N.

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## SPANISH VACCINATION EDICT.

Boston, March 25, 1921

*Mr. Editor:*—

In view of the recent opposition in this state to compulsory vaccination, I am sending you the clipping attached hereto, to show how this matter was settled in Spain—by royal decree:

> "Un decreto reale ordina la vaccinazione per prevenire il vaiuolo, obbligatoriamente, per tutti i bambini."

Translated, it reads: "A royal decree orders compulsory vaccination for all infants, to prevent smallpox."

Would that some such decree could be issued in this state in favor of compulsory vaccination!

Yours very truly,
Gaetano Praino.

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## ETHER-DRINKING IN WESTFIELD.

Springfield, April 8, 1921.

*Mr. Editor:*—

In answer to your letter regarding the use of ether among the laity of Westfield, I would say that the habit seems to be confined to the Polish people. For some time these people have added ether to their beer, which, as you know, they use freely. It seems to have been given to children, not to allay the pangs of hunger, but merely to keep them quiet—a sort of soothing syrup, so to speak. The ether is ingested, never inhaled. Certain grocery stores have sold the commodity, openly and freely, and are continuing to do so. I understand that the Westfield Board of Health has the matter under advisement.

Very truly yours'
Allen G. Rice.

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## NOTICE.

Beth Israel Hospital.—There will be a clinical meeting in the auditorium of the Beth Israel Hospital, on Wednesday evening, April 13, at 8.15 p.m.

PROGRAM.

"Newer Developments in the Study of Pyelitis"
Dr. E. Grenville Crabtree

Discussion : Dr. Fritz Irving, Dr. Richard M. Smith, Dr. A. L. Chute.

Physicians are cordially invited. The telephone is Roxbury 5940 and visitors may be on call.

Refreshments will be served.

Albert Ehrenfried, M.D., *Chairman*,
Committee on Clinical Meetings

## RECENT DEATHS.

Julius Maltby Dutton died at his home in Westfield, of encephalitis lethargica, January 29, 1921, aged 43 years. He was a graduate of Dartmouth College in 1900, and of Dartmouth Medical School in 1903. He was a member of the American Medical Association and the Massachusetts Medical Society.

Lawrence Chesley Chisholm, a Fellow of the Massachusetts Medical Society, died in Boston, April 2, 1921, aged 29 years. He was a graduate of Tufts College Medical School in the class of 1917, and settled in Salem, removing to Allston.

Albert Fred Peck, M.D., died at his home in Spencer, March 31, 1921, aged 58 years, nine months, 20 days. The cause of death was heart disease, with which he had been ill for three weeks. Dr. Peck was born in Montgomery, Vt., in 1863, attended the schools of that town and took an M.D. from the University of Vermont in 1887. He settled in Woburn, Massachusetts in 1895, moving to Worcester in 1899, and to Spencer in 1905. He was a Fellow of the Massachusetts Medical Society, a Mason, and an Odd Fellow. His widow, a daughter and a son survive him, the son being Dr. Edward B. Peck of Perth Amboy, New Jersey. Another son, Albert, died in France during the World War.

Dr. Joseph Ransohoff, professor of surgery at the University of Cincinnati, died, on March 10, at Cincinnati on May 26, 1853. He received his medical degree from the Medical College of Ohio in 1874, and the Royal College of Surgeons, London, in 1877. Since that time, he has served in the Departments of Anatomy and Surgery at the University of Cincinnati. Dr. Ransohoff was a fellow of a number of surgical societies and had contributed extensively to literature on surgical subjects.

Dr. Andrew Jackson Stevens died at his home in Malden, February 23, 1921, of pneumonia, at the age of 74. He was born in Warren, N. H., April 24, 1846, was educated in the schools of Haverhill and at Harvard Medical School where he received his M.D. in 1869, and settled in Lawrence, joining the Massachusetts Medical Society in that year. He practised in Holliston from 1875 to 1890, when he moved to Malden to spend the remainder of his life. There he helped to found the Malden Hospital and the Malden Milk Commission. He was a member of the American Medical Association, a Mason and an Odd Fellow. Dr. Stevens was twice married, first to Jennie Stone Powers of Lawrence, and second, to Catherine C. Frost of Malden, who survives him with three sons.

Dr. Oren Andrews died at his home in Gardner, Mass., April 2, 1921, aged 56 years. He was born in New Salem, N. H., was educated at the New Salem Academy and at the College of Physicians and Surgeons, Baltimore, in 1895. He settled in Orange, Mass., moving to Gardner in 1896 and joining the Massachusetts Medical Society in 1915. The cause of death was apoplexy. He was unmarried.

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### THE RATIONALE OF FORCING FLUIDS.

By GEORGE GILBERT SMITH, M.D., F.A.C.S., BOSTON.

THE forcing of fluids in patients with deficient urinary excretion has shown such striking results, both in the increase in the amount of urine and in the improvement in the general condition of the patient, that it has seemed worth while to gather together certain data bearing on this question, especially in regard to the physiological factors involved.

The "modern theory" of renal secretion, as presented by Cushny in his most excellent monograph on "The Secretion of the Urine,"[1] supposes the secretion to be accomplished by two separate agents—the glomeruli and the convoluted tubules. Each glomerulus, you will recall, receives an afferent branch from the renal artery. This arteriole breaks up into a network of capillaries, which unite again to form an efferent vessel. This efferent vessel breaks up to form a network of capillaries about the tubule, and indeed forms the only blood supply of the latter.

The glomerulus acts solely as a filter; filtration depends upon: (1) the difference of pressure on the two sides of the membrane (blood pressure *vs.* ureter pressure); (2) upon the permeability of the membrane, which may vary from time to time according to various influences, such as lack of oxygen; (3) upon the osmotic pressure of the colloids of the blood serum (Cushny, pages 45-46).

These colloids will not pass through the filter; they hold the other constituents of the blood plasma by an osmotic pressure, equal to about 30 mm. of mercury. A blood pressure of at least 30 mm. is therefore required to separate from the colloids those substances which will pass through the filter. "The greater the concentration of colloid, the less filtrate will be formed at any given capillary pressure" (Cushny, p. 46); in other words, if the blood pressure within the capillaries is greater than the osmotic pressure of the colloids, filtration will take place and a fluid will pass from the capillaries into Bowman's capsule. This fluid is practically identical with the blood plasma minus its colloids or proteins (Cushny, p. 168). It is neutral in reaction and contains water, dextrose, uric acid, urea, sodium, potassium, chloride, Ca and Mg, phosphates and sulphates. The proportions of these substances in the glomerular filtrate, however, are very different from their proportions in the urine.

As the glomerular filtrate — deproteinized plasma, as Cushny calls it — passes down through convoluted tubules, the cells of the tubules reabsorb certain of its constituents. These constituents Cushny divides into threshold and no-threshold bodies; the former are found in the urine only when their proportion in the blood exceeds a certain threshold value, while others are excreted in proportion to their absolute amount in the plasma. Threshold bodies are chloride, sodium and dextrose. No-threshold bodies include urea, foreign bodies (phenolsulphonephthalein), sulphates, phosphates and ammonium. The latter are present in much higher concentration in the urine than in the plasma. Thus urea is excreted in the urine as long as any is in the blood, while dextrose is practically entirely reabsorbed unless the amount in the blood exceeds the threshold value as it does in diabetes. It is evident that, in order to obtain a concentration of a given substance in the urine greater than there was in the blood, a large amount of the water of the filtrate must be reabsorbed in its passage through the tubules. Cushny estimates that normally less than one-third of one per cent. of the amount of water filtered through the glomerulus finally escapes into the ureter.

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* Read before the Surgical Fortnightly Society, Dec. 2, 1920.

So much for the physiology of the kidney; the preceding statements are based upon vast quantities of experimental work and constitute, I believe, the accepted belief of present-day physiologists in regard to the secretion of urine.

In regard to the efficiency of the kidney as a means of ridding the body of waste products, it would appear that the function of filtration is the more important of the two types of renal activity. Reabsorption is necessary, because without it, the kidney would have to withdraw from the blood an altogether impossible quantity of water and of certain essential salts in order to get rid of the waste products. Filtration, however, is the process which actually removes the substances from the blood; reabsorption is secondary to filtration. An increase in the amount of the filtrate, therefore, increases the amount of waste products excreted. This increase is not parallel, but it has been shown by Albarran (Vaquez and Cottet, *Rev. de Med.*, Paris, 1910, xxx, p. 520) that under experimental polyuria, not only is the output of water increased, but the actual amount of urea excreted is increased. In order to increase elimination, therefore, the amount of filtrate must be increased. We have seen that filtration depends upon: (1) the blood pressure; (2) the character of the membrane; (3) the osmotic pressure of the colloids in the blood serum.

Let us first consider the influence which forcing fluids exerts upon filtration by changing the blood pressure. So far as I know, the ingestion of water and the administration of saline solution subcutaneously have no effect upon the blood pressure. In regard to the intravenous injection of saline solutions, Cushny (p. 127) says that "these (experiments) all point to one conclusion—that while the diuresis from the intravenous injection of saline solution is often accompanied by acceleration of the renal bloodflow, this is not by any means always true. Similarly, the arterial pressure sometimes rises, but frequently undergoes no marked change, or may fall during the diuresis. Thus the mechanical factor does not suffice to explain the saline diuresis, though it often coöperates with the chemical changes in the plasma to increase the secretion."

The second factor in filtration is the condition of the filtering membrane. The work upon this phase of the subject seems to be fairly scanty. Cushny (p. 45) speaks of the increased resistance to permeation due to insufficient oxygen, and to "some pathological states." Congestion of the kidneys—the interference with their circulation — depletes the available oxygen and may therefore decrease the permeability of the filter. This point will be brought up later. It seems not unlikely that the production of acid in the tissues of the kidney might decrease the filtration power of the glomeruli. Martin Fischer[2] found that injecting acid into the blood stream of a rabbit produced albuminuria and a decrease in the amount of urine excreted.

The third factor in filtration—the osmotic pressure of the colloids of the blood plasma—has been more thoroughly investigated. The work of Knowlton is interesting. He sought the cause of diuresis after the administration of salines (Knowlton, *J. Physiol.*, London, 1911, xiii, p. 219). Changes produced in the blood by salines are: (1) the lowering of the osmotic pressure of the proteins by dilution; (2) the decrease in the viscosity of the blood. Knowlton, by the injection of Ringer's solution, brought about a diuresis. The addition of gelatine, which is of high osmotic pressure, greatly reduced the diuresis. The blood pressure and the rate of blood flow through the kidney were as great, or greater, during the injection of gelatine. The addition of starch solution, which increases viscosity, but not osmotic pressure, did not inhibit diuresis. Knowlton, therefore, concludes that saline diuresis is due largely to the dilution of colloids. Starling says this dilution of the blood plasma in reducing the colloid concentration increases the amount of the filtrate from the capsule.

To recapitulate: Saline diuresis (or that due to ingestion of large quantities of water) is brought about through a dilution of the colloids of the blood plasma and a consequent lowering of osmotic pressure. The influence of the saline upon the quality of the blood and upon the rate of the blood flow through the kidney, and thereby upon the permeability of the glomerular membrane, may also be an important factor in diuresis.

There are, in practical use, three ways of increasing the fluid content of the body—ingestion into the alimentary tract, subcutaneous injection of the normal saline solution and intravenous injection of the same. Cow (*J. Physiol.*, 1914, XIV, iii, p. 1-17) asserted that water taken by mouth caused greater diuresis than salt solution intravenously or under the skin. He attributed this fact to the diuretic effect of a ferment found in the mucosa of the alimentary tract, and in support of this theory showed experimentally that the intravenous injection of saline containing extract of gastrointestinal mucosa caused a larger and more pronounced diuresis than did the saline alone. This work has been refuted by Hashimoto, who shows that as water is absorbed from the alimentary tract, it takes up salts and then acts on the kidney in the same way as a dilute saline solution injected intravenously.

### THE INDICATIONS FOR FORCING FLUIDS.

In Healthy Kidneys: The usual preparation for an operation under general anesthesia has the effect of reducing the fluids of the body quite extensively. A cathartic or even a purge is given, followed by several watery stools. The morning of operation no fluids are allowed except perhaps a few ounces of black coffee. The patient is then etherized, frequently sweats profusely during the anesthesia and vomits afterwards. He is given water very cautiously by his nurse, who fears to let him have all he wants. Under these conditions the blood plasma becomes concentrated and the colloids increase in osmotic pressure, thereby greatly reducing the filtration through the kidney. Not infrequently, especially in children, signs of acidosis appear in the urine. In many cases, the urine contains albumin and casts. These findings bear out Fischer's suggestion, that there is an excess production of acid in the tissues. We have seen that acidity increases the resistance of the glomeruli to filtration; hence the acidosis after etherization is another factor in limiting the ability of the kidney to excrete properly. Consequently, even in a patient with healthy kidneys, we often find the signs of renal insufficiency, *i.e.*, soft distention, dry tongue and nausea. Being nauseated, the patient cannot take water, thereby increasing the symptoms. One subpectoral injection of a liter of normal salt solution will usually suffice to break the vicious circle. It is far better, however, to anticipate the lack of fluids by: (1) forcing fluids until one or two hours before operation; (2) immediately after operation giving either a subpectoral infusion or three pints of tap water by rectum. The latter, if given before the patient comes out of ether, will usually be retained. After that, the Murphy drip may be used or tap water may be given rectally, eight ounces every six hours.

In Damaged Kidneys: If normal kidneys will react in this way to a lack of fluid, how much more seriously affected are damaged kidneys. I refer particularly to the kidneys of urinary retention, whose ability to excrete has been taken away at least temporarily by long-continued back pressure. Cushny (p. 110) says: "In glomerular filtration the capillary pressure is the driving force and if this is taken as 20% lower than the carotid pressure, the difference between the pressure in the capillaries and the maximum ureter pressure, that is, the difference of pressure on the two sides of the capsule, amounts to about 30-50 mm. of mercury. The pressure requisite to force the filtrate through the capsule against the osmotic resistance of the plasma colloids is about 30 mm. of mercury, and the capillary pressure must, therefore, always exceed that within the capsule by this amount." I do not know what the pressure is in an over-distended bladder, but, without doubt, it hinders renal filtration. We know that there is a retention of non-protein nitrogen in the blood of men with chronic urinary obstruction. When the obstruction is removed, the kidneys, if not too seriously damaged, respond by a tremendous diuresis. In other cases, the sudden removal of obstruction is followed by a nearly complete cessation of secretion. It is generally believed that this is due to the congestion of the kidneys, which respond to the sudden decrease in pressure just as the bladder does, that is, by an intense engorgement of the capillaries. Venous congestion, as we have seen, is accompanied by a lack of oxygen and a consequent loss of the permeability of the filtering membrane. There is no other reason for the immediate cessation of renal activity, so far as I can see, for the blood pressure and the colloidal concentration of the blood, which are the other two factors involved in infiltration, are unlikely to change in so short a time. Later, of course, infection may become superimposed upon the congestion, and is, no doubt, a great factor in limiting renal activity. It is not uncommon, however, to see partial anuria set in in a patient whose urine is as yet uninfected, and whose normal temperature makes it seem improbable that a hematogenous invasion of the kidneys has occurred.

In such patients, the inability of the kidneys to function becomes a serious problem. In fact, unless it is met by prompt and efficient measures, the suppression of the urine not infrequently brings about a fatal outcome. The one most efficient method is the forcing of fluids, by mouth, by rectum, or underneath the skin. I recollect one case in which 20 consecutive subpectoral infusions were given before the kidneys became able to carry on their work without such assistance. I have given or seen given literally hundreds of subpectoral infusions, but no abscess has resulted. Even a severe diabetic, who was given salt solution subcutaneously a number of times, showed no evidence of infection of the breasts.

The question will be asked as to how far fluids can be forced without doing harm. With a sound heart and fairly good kidneys, an intake of 200 ounces every 24 hours is not at all excessive. We had a patient who on two consecutive days drank 378 and 376 ounces and whose output on the second day was 463 ounces (3.5 gallons). Fischer states that excessive water drinking causes albuminuria, as it washes out the salt from the tissues. This objection would, of course, be met by the infusion of normal salt solution.

As prostatic obstruction occurs chiefly in men of advanced years, it is not surprising that many of those who come to operation for this trouble have arteriosclerotic hearts. The medical consultant who sees these cases often advises limiting the fluid intake. My experience has led me to believe that this should not be done unless the patient has oedema. Fischer suggests that limiting the fluid intake in cardiac decompensation is a relic of the belief that the urinary secretion is brought about by the pushing of the water through the kidney by the heart. He believes that increasing the fluid intake by reducing the viscosity of the blood, really lessens the work of the heart[2] (p. 131).

There is much need for further investigation of the physiological chemistry of the body after operation, and in cases of renal insufficiency. The question as to how great a part acidosis plays in these conditions is important and, so far as I know, it is as yet unanswered.* Of the value of forced fluids in the above situations, there can be no doubt. The elimination of waste products through the kidneys depends upon filtration; filtration depends upon (1) the condition of the filtering membrane; (2) the dilution of the colloids of the blood plasma. Both of these conditions are influenced favorably by increasing the fluid content of the blood.

REFERENCES.

[1] Cushing, A. R.: The Secretion of the Urine. 1917. Longmans, Green & Co.
[2] Fischer, Martin: Nephritis. 1912. John Wiley & Sons.

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# STRANGULATED HERNIA IN THE AGED. LOCAL ANESTHESIA. CASE REPORTS.

By Martin T. Field, M.D., F.A.C.S., Salem, Mass.

After many years of wear and tear and histological changes due to advancing age, anatomic defects become more pronounced. These defects are aggravated by bronchitis and other afflictions common at this time of life. It is not surprising, therefore, that strangulated hernia is a potential danger always present in the aged.

Unless we are watchful, it is an easy matter to overlook a small strangulated hernia and diagnose the symptoms as those of some gastro-intestinal or other disturbance common in old people. A positive diagnosis established, the method of relief is then of vital importance.

Operation for strangulated hernia under local anesthesia, is one of the good things in surgery that cannot be too highly recommended. It, at once, eliminates many of the dangers which make other types of acute intestinal obstruction, under a general anesthetic, yield such a high mortality.

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* This question is now under investigation by Shedden, Resident Surgeon on the Genito-Urinary Service, Massachusetts General Hospital.

Statistics from the larger hospitals, show that the mortality incident to acute intestinal obstruction, excluding strangulated hernia, has not been greatly reduced the last ten or fifteen years. Fortunately, the operative mortality of strangulated hernia has shown much greater improvement.

The factors that have brought about this are:

*Earlier recognition;*

*Less manipulation of the hernia mass.*

*Operation under local anesthesia.*

Every patient suffering acute abdominal pain with or without vomiting or constipation, should have the inguinal and femoral rings examined to ascertain the possibility of strangulation. Neglect of this precaution leads to humiliating and disastrous results. The diagnosis of hernia made, it is brutal and injurious to use much force in the effort to reduce a hernia that is often reduced only with difficulty with the parts wide open.

Local anesthesia is particularly suitable in the treatment of strangulated hernia, unlike many other types of acute intestinal obstruction. The point of obstruction is at once known without searching for it. There is required a minimum amount of traction on the abdominal wall and mesentery and the parts are readily accessible.

The technique used in these cases (common types) is briefly as follows:—

Inguinal hernia.

Infiltration of skin and subcutaneous tissues along line of usual incision with 0.5 per cent. novocain, then the needle is plunged straight down until it overcomes the resistance of the external oblique aponeurosis. About one-half ounce of solution is deposited beneath this structure in the position of the ilioinguinal nerve. A little is also injected in the region of the external ring. After waiting a few minutes the incision is then carried down to the external oblique. This structure is carefully opened near the internal ring and the flaps raised, exposing the ilioinguinal nerve which lies on the internal oblique muscle. The nerve is at once blocked by injecting a small amount of solution into it, which immediately turns white.

This nerve controls nearly nine-tenths of the sensation of this region. The aponeurosis is now cut down through the external ring and also above the internal ring, exposing iliohypogastric nerve which is also blocked. This nerve lies above the arching fibres of internal oblique above the ileoinguinal and parallel with it. Both these nerves lie beneath the external oblique lying upon the internal oblique and run from without inward. They control all the sensation except that of the genital branch of the genitocrural, which lies in the posterior part of the cord and can be blocked later on or as is usually the case, a small amount of solution can be injected about the upper part of the cord which accomplishes the same result. Care must be taken not to puncture any veins. No more novocain is required except when sac is tied; a little novocain is then injected to render the parietal peritoneum insensitive.

The radical operation is now performed, either with or without removal of the testicle. In old men, especially, with recurrent hernia, removal of testicle helps to prevent recurrence. Removal was carried out in Cases 3, 4 and 5.

There may be some anomaly of nerve distribution, but usually the ilioinguinal, iliohypogastric and genital branch of the genito-crural are found in the position cited. If these are blocked, there will be no pain.

*Femoral Hernia.* This type of hernia must be treated differently from preceding. The technique is simpler. There are so many nerve branches coming into this region from all sides that it is necessary to use the infiltration method. The skin is injected along line of incision, which is a vertical one, the subcutaneous tissues and tissues about the sac are also injected. The fat is separated from sac. Gimbernat's ligament must be either cut or stretched with small retractor. It is rarely necessary to cut Poupart's ligament unless hernia is very large. If cut, it must be repaired later. This ligament had to be divided in Case 1.

The neck of sac is freed carefully from surrounding tissues by finger or retractor. There is usually fluid between intestine and sac; occasionally there is not (Case 7). There was not a drop of fluid in this sac and I do not believe any escaped into the abdominal cavity. The black bowel and sac wall were in close contact. I mention this as an exception to the rule that fluid is present between bowel and sac-wall. Much care must therefore be exercised in opening sac, not to injure the intestine.

When Gimbernat's ligament has been cut or stretched and the tissues about the neck of the sac freed, the hernia can be generally reduced. Occasionally this cannot be accomplished, as in Case 8, because of the constriction of the thickened sac itself. It is then necessary to introduce a hernia knife between gut and sac and cut constriction.

It is well to draw out bowel beyond constriction and inspect it. If it is reduced first, it will be sometimes difficult and dangerous to pull out a diseased segment of bowel from within abdominal cavity through small opening. Hot salt pads are applied until the circulation returns, taking as much time as is needed. The bowel is insensitive to pain; it can be cut or burned without causing discomfort. Traction on mesentery, however, will cause pain. After injecting a little solution about the neck of sac, it is tied off and resected, first transfixing it. It is allowed to retract within the abdominal cavity and Poupart's ligament is sutured to pectineus muscle and fascia, including in the bite of the needle all tissues down to the periosteum of the pubis bone. The femoral vein is retracted very carefully when first or external stitch is introduced. Two or three other interrupted sutures, internal to this as far as the pubic spine can then be easily put in.

The wound is closed without drainage. My own experience leads me to believe that this type of operation is simpler and safer in these old people than the inguinal operation for femoral hernia, as advocated by Seelig and Tuholski and others.

The following cases illustrate the value of this technique:

Case 1. Mrs. N., aged 73 years. Strangulated femoral hernia, three days' duration, constant abdominal pain and distention, persistent vomiting, very foul. Operation August 7, 1917, local anesthesia. Large coil of strangulated small intestine, very dark, reduced with difficulty. It was found necessary to cut Poupart's ligament, before reduction was possible. Radical cure, convalescence was complicated by pneumonia. Left the hospital well August 16, 1917.

Case 2. Mrs. K. B., aged 70 years. One week prior to this she was operated upon by another surgeon for strangulated femoral hernia. Incision was made and the mass reduced. There was no relief, and vomiting and pain continued throughout whole week; vomitus fecal; no mass to be felt at ring. Operation, local anesthesia, October 17, 1918. Right rectus incision, small intestine found obstructed at femoral ring. It was evident that at previous operation sac and all had been simply reduced without relieving strangulation. The obstruction was released with much difficulty. I thought it was best to take a chance and not resect, in view of serious condition. Repair of hernia was also done. Convalescence uneventful. One year later returned to hospital for relief of stomach symptoms; inoperable cancer of pylorus found; gastroenterostomy done. Left hospital in two weeks improved. Now dead.

Case 3. Mr. H., aged 83 years. Strangulated inguinal hernia, forty-eight hours' duration, abdominal pain, distention and vomiting. Operation July 9, 1919, local anesthesia. Large mass on left side, irreducible; found to be large sliding hernia of sigmoid. Further search disclosed a small coil of small intestine strangulated in lower part of canal (direct hernia). Color returned after hot applications were applied. Sac resected. This and sliding hernia were repaired as well as possible. Testicle removed so that better repair could be made. Patient was delirious for several days: cough troublesome. Left hospital well July 24, 1919. Is now in good health.

Case 4. Mr. C, aged 71 years. Strangulated inguinal hernia (right oblique). Two years prior to this, was operated upon for strangulation, followed by recurrence. Present attack began about six hours before operation. Abdominal pain and vomiting. Operation, December 11, 1919, local anesthesia. Large hernia, small intestine strangulated. Color returned after hot applications were applied. Radical cure after removal of testicle. Patient left hospital December 28, 1919. The last time seen, several months after operation, was well.

Case 5. Mr. R., aged 77 years. Strangulated inguinal hernia (right oblique). Operation, June 27, 1920, local anesthesia. Large sac resected, radical cure after removal of testicle. Left hospital July 11, 1920. Has since been well.

Case 6. Miss O'C., aged 86 years. Strangulated right femoral hernia, four days' duration. Abdominal pain, distention, and vomiting. Loops of distended bowel evident. The day of the operation, vomitus distinctly fecal. Operation September 4, 1920, local anesthesia. Intestine reduced with difficulty, color did not return very well. Thought better to take a chance and not resect. Convalescence uneventful. Left hospital September 19, 1920. Has since been well.

Case 7. Mrs. F., aged 90 years. Strangulated right femoral hernia; sick for three days. Pain, vomiting and prostration cause of severe pulmonary symptoms. Her trouble was first thought to be pneumonia. Later, small irreducible mass was discovered. Patient in very poor condition and family objected strongly to operation, believing that she would surely die. Operation

September 27, 1920, local anesthesia. Small coil of very dark bowel liberated and reduced; no fluid in sac. Sac wall and intestine in contact. Radical cure. Left the hospital in good condition after four days, October 1, 1920. She has since been well, except for the bronchitis and other infirmities she has had for years.

Case 8. Mr. B., aged 67 years. Strangulated left femoral hernia, eleven hours' duration. Abdominal pain, vomiting and some distention present. Operation, October 4, 1920, local anesthesia. Fair-sized hernia mass. Gimbernat's ligament cut and tissue freed about neck of sac. Sac opened. Intestine very dark; impossible to reduce it, even though finger could be passed about neck of sac. It was necessary to insert hernia knife within sac and cut thick constricting neck. Radical cure. Convalescence uneventful. Left hospital well, October 19, 1920.

Gastric lavage was done in nearly all the patients.

This report, covering a three-year period, does not include ether patients or those under 65 years of age. Some strangulated cases, old and young, were given ether for one reason or another; but all of these were good risks and vomiting was not a prominent factor. I believe, however, that the margin of safety was narrowed considerably by giving these patients general anesthesia.

The only cases reported in this list are those well advanced in years and done under local anesthesia. The ages are from 67 to 90 years, the average age being 77 years. These are not picked, but consecutive cases, operated upon in this way because of poor risk. All these patients recovered, a result, I am sure, that could not have been obtained with general anesthesia. In looking back over my experience during a period of ten years of ether, I can recall three operative deaths and two of these were no worse than some of the cases reported. This is my excuse for publishing this report.

In conclusion, it seems logical to state that every patient with strangulated hernia should be given the chance to live, which operation alone can give, no matter how old or debilitated or how long the strangulation has existed (cases 6 and 7).

Resection of the bowel should not be performed unless there is urgent need of it. Statistics show that nearly all these primary resections and repair cases, especially in old people, die. If the bowel is hopelessly diseased, it is ordinarily better to drain and repair later. In some of these cases reported, there was considerable doubt as to the viability of the bowel; yet, in all these cases, convalescence was uneventful.

On the other hand, the operative mortality of simple hernia in the young adult, under general anesthesia is practically *nil*. In these cases, there is no serious objection to ether. In old and debilitated patients, there is considerable objection. In the presence of strangulation, especially in the aged, local anesthesia is imperative.

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# SIGNIFICANT REACTIONS OF THE ARTERIAL TENSION, MANIFESTATIONS OF THE ANGIO-KINETIC ENERGY, CLINICALLY OBSERVED AND INTERPRETED.*

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Since the publication of my article on the "Normal Arterial Tension in the Boston Medical and Surgical Journal, March 6, 1919, questions in relation to the radialis maximum tension have been repeatedly addressed to the author, questions which cannot be answered by snapshot remarks. In view of the importance and complexity of the subject, my answers, written as briefly as is consistent with adequacy and lucidity, have taken form of the series of chapters which will be here presented in logical sequence.

For the conception, clinical observation, formulation and interpretation of the several biological tests—angiokinetic reflex tests as well as biochemical—made use of in my investigations and described in this communication and in my earlier publications, I am responsible, personally. Conversely, references made, especially in Chapter III, to such physiological mechanisms as are known through laboratory investigations previously made, have been drawn from standard physiological literature, particularly from textbooks and monographs by the authors indicated in the list of literature at the end of Chapter IV (1-15).

## I. IDENTITY OF RADIALIS MAXIMUM TENSION.

In the present paper the author will endeavor in some measure to elucidate the particular identity, nature and significance of the radialis maximum tension, and of certain reactions of

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* Received for publication October 28, 1920.

the arterial tension which are observable and measurable at the radialis and also to exemplify the practical value of the study of these reactions, particularly with reference to neurology and psychiatry, and also general medicine. For this purpose, certain reactions of the arterial tension will be described, which frequently are associated with various psycho-neurological symptoms and not rarely connected with phenomena, popularly denominated "spells," fainting spells or others.

The present paper is not devoted to expostulation of any technical details. It is written because the facts observed and herein discussed emphasize the advantage of objectivity of observation and interpretation and also objectivity in the practical application of findings. Here is not the place for description of various instruments and their uses. Such knowledge must be acquired by practice in teaching-institutions. It cannot properly be given in a discussion of interpretation and clinical application lest the description be either incomplete and thus possibly misleading, or else blocking in its effect upon the presentation of the scientific subject under consideration. Therefore, it must suffice here to say that from a scientific point of view, the only essential requirement of an instrument for the measurement of the radialis maximum tension, *i.e.*, a "radialis-arteriotonometer," is that it must be so constructed that the artery is to be compressed by means of a small pelotte, *i.e.*, of about the size equal to the palpation surface of the examiner's index finger. Reasons for this requirement will appear on subsequent pages. Beyond that, additional instrumental devices necessary for measuring and recording the amount of pressure used for obliteration of the pulse-wave may vary within very wide limits and all be acceptable. Any reference made in this paper to different methods is made only for the purpose of attaining an adequate clinical-physiological interpretation of the identity, nature and significance of the findings obtained, no matter which kind of instrument may be used.

When performing the measurement, the examiner must perceive the difference between the sensation conveyed through his touch by the pulse-wave passing through beneath his finger and the sensation of the pulse obliterated by the counter pressure of the instrument upon the artery. He must perceive exactly that moment of time when, at a slowly increasing pressure of the instrument, the *next* arriving pulse-wave, *even at the moment of time at which it reaches its maximal tension,* cannot overcome the counter pressure upon the artery. At just that moment of time he must read the amount of pressure employed. The value read is the *identical radialis maximum tension, i.e., the amount of pressure which is the smallest counter pressure upon the artery which the pulse-wave at the moment of its maximal tension cannot overcome.*

The radialis maximum tension, in its physiological normality, as well as in numerous pathological states, has been the object of the author's study and observation since the year 1904. Such observations constitute the material of facts upon which the present inquiry is based. More than 40,000—approaching 50,000—such measurements have been made and studied by the author during the intervening years. It may not be amiss here to emphasize the fact that the anatomical point at which these observations and measurements are focussed is invariably the same. It is precisely the point above the wrist-joint, at which the pulsations of the radialis artery are visible and palpable as most superficial. This is identically the classical point at which the routine examination of the pulse, the "feeling of the pulse," is made by every physician in all lands, as has been done by generations of physicians before, throughout a long line of centuries at the historical dawn of which, more than 4,500 years ago, the ancient physicians of the Far East, appear to have already acquired a skill of performance and a profundity of interpretation in comparison with which subsequent observations, even down to our age, bear the mark of more or less superficiality.

A book on the "Ancient Art of Feeling the Pulse," written 4,506 years ago by an Emperor of the Far East, is the oldest book in reference to the subject, of which the author has found mention in the literature. Much to his regret, the author has not succeeded in finding the name of the Emperor-author, nor of the shrine into whose keeping the precious volume is entrusted, much less found opportunity to deepen his insight in matters pertaining to the pulse through a pilgrimage to this most ancient spring of angio-kinetic information.

## II. VASCULAR PRESSOR AND DEPRESSOR REACTIONS.

The *theory of vasomotility*, which is a summation of the brilliant achievements in this field of laboratory physiology from the fundamental discoveries of vasoconstriction and vasodilation (1851-1858, Claude Bernard, Brown-Séquard and Schiff), and of the vasomotor centre in the bulb (1864, Ludwig-Thiry) to the present time—is built upon elementary facts acquired by ingenious and painstaking experiments upon animals. The nature of these experimental methods precludes unavoidably their direct transplantation to the field of clinical investigation, made up as they are, in the main, by observing the immediate and subsequent effects of dividing the nerves to various organs and of electric excitation of the central and peripheral ends of the cut nerve, also by direct electric excitation of various organs. Other stimuli than electric occur, although with lesser prominence. When effects of chemical substances, introduced per os or in the blood, are investigated, canules inserted into the cut ends of carotid or other artery transfer the pressure effects on the blood upon recording instruments of various devices. Thus the effect of the chemical excitant is complicated by the effect of the psychic and trauma-shock upon the animal, and also by the effect upon the vasomotility produced by the narcotic employed for anesthetic purpose. Briefly: the end result of the experiment is considerably complicated, besides the nature of the experiment precluding its transplantation to the clinical field. Considering the brilliancy of achievement and the wealth of result in this most important department of the history of medical science, one cannot but feel that clinical methods of investigation have not as yet attained a development commensurate with the importance of the subject. In consequence, the compass of learning possessed by experimental physiology has not in clinical medicine condensed an application which adequately confirms or demonstrates the practical significance of the present physiological theory of vasomotility.

This being so, and considering the distinctive character of the radialis maximum tension as formulated in preceding chapter and further interpreted and demonstrated in subsequent chapters, the author of this inquiry has felt induced to endeavor to utilize the radialis maximum tension as basic value for comparison of the magnitudes and clinical character of vascular reflexes under physiological conditions and in morbid states. In order to facilitate the fullest comprehension of this chapter, the author begs to anticipate at this point the information which will be argued and proven in subsequent chapters, *viz.*, that the changes in the radialis maximum tension give a direct numerical expression of the angio-kinetic activity in the circulatory periphery and that in this aspect as well as in others which will be proven later, it is of different identity than the so-called blood-pressure, as clinically determined at present, and that these two differing identities are dominated by entirely different mechanisms leading to values which are incommensurable, the one with the other. The one cannot be computed from the other as known; both of them are important and valuable but of different clinical significance.

Many variations of procedure are imaginable whereby reflex reactions of the arterial tension may be obtained and observed clinically. In view of the continuous expansion of the armamentarium of tests for diagnostic purpose which is an unavoidable sequence of the tendencies in present evolution of medicine, it is obviously important in the selection of any method of clinical examination to take under consideration in how far the time consumed by making the test, is favorably balanced by the exactitude of the findings, the certitude of their interpretation and the value of the result with reference to diagnosis, prognosis and formulation of therapeutic indications.

In order to obtain a rapid orientation in the state of the arterial tension, the author has frequently made use of the following manner of proceeding: for examination, the patient (when not otherwise indicated) is seated in a chair, in a restful position, with arms supported in a manner to secure passivity to the muscles. It goes without saying that by constantly making use of the same chair, with or without special construction for the purpose, the patient and the examiner every time assuming the same attitude, etc., something may be gained in favor of uniformity of results. This is not necessary. By much practise the individual examiner makes himself completely independent of external rules in the measure as he acquires adequate visualization of the physiological mechanisms involved in the proceeding and of any incidental complication that might present itself.

Only one rule is indispensable. In the examination room, quiet and order must prevail without the necessity of disciplinary supervision and effort from the part of the examiner. The patient must be undisturbed in his passivity, and the examiner must be left undisturbed in focussing his attention upon the examination.

With the above general considerations in mind, the following four tests, *a-d*, are made, the one after the other without interrogation or intervening delay, as all four together constitute one complex test:

*a.* Examine the radialis maximum tension on the patient's right arm and note its zipher value.

*b.* A few light strokes are made with the examiner's hand over the skin of the right side of the patient's neck, three or four strokes up and down from the level of the ear to the middle of the shoulder, merely touching the skin, without exercising any pressure. As soon as it is done, renewed measurement of radialis maximum tension of right arm is made and value *b* noted.

*c.* Take up a small fold of the skin of the same area on the right side of the patient's neck and pinch it sharply for a brief moment between the nails of the examiner's first and second finger. This done, the examiner makes a renewed measurement of the radialis maximum tension of the right arm, and the value *c* is noted.

*d.* With the second finger of his right hand, the examiner applies a sharp pressure over the patient's right ulnar nerve at the dorsal side of the elbow where the nerve is exposed superficially under the skin and subcutaneous tissue, forcing it between the tip of his finger and the underlying epicondyle of ulnaris—a snapping, short, sharp pinch. This done, renewed measurement of the radialis maximum of the right arm is again made, and the value found, *d* is noted.

Thus four values of the radialis maximum tension of the right arm have been obtained. It is important in the tests, *b*, *c*, and *d* that the renewed reading of the radialis maximum should be made at about 15 seconds after the preceding mechanical stimulus has been applied. In some cases 20 seconds after mechanical stimulus is too late, in other cases a delay of several minutes would not impair the test. It is important that the pinch of the ulnar nerve should not be harmful. There is much experience in support of the assumption that, properly done, it is harmless.

The result of these four tests vary within very wide limits, in one and the same individual at different states of the disease, or even without apparent change in the state of the disease, they may vary in the same individual during the same day, under various influences, ordinarily not controlled, but *capable of being controlled* when their mechanisms and significance is understood. As examples of concrete cases and for the purpose of an introductory discussion of the mechanism and the significance of these tests, the results of a few examinations recently made by the author in the Department of Nerve and Mental Diseases, Boston Dispensary, are found in appended Table I.

Except when indicated otherwise (No. 12) the cases referred to in Table I are patients who have consulted the Department of Nerve and Mental Diseases of the Boston Dispensary on the dates indicated in the table. The cases are not selected for Table I in any other sense than that one example or two of each of the basic (test *a*) radialis maximum values as observed, from 70 mm. to 320 mm., have been arranged in order of ascending value from the lowest to the highest. The cases represent the average of the class of cases that form the majority of visitors to the clinic. It will be further explained that one case on the table (No. 12) is exceptional and represents the normal radialis maximum tension: all the others are more or less pathological.

Values lower than 70 mm. and higher than 320 mm., have been observed by the author, but they are omitted from Table I on account of the difficulties connected with their measurement. Between 70 and 320 mm., the measurements are reliable. The remark must be made, however, that below 100 mm. and above 280 mm. Hg., there is increasingly greater difficulty in reading the exact value, a difficulty which is vanquished by continuous practice. In 26 of the cases on Table I, all the four tests, *a-d*, have been made. If, in these 26 cases, we compare the several values, *b*, *c* and *d*, on the one

Table I.

| No. | Name | Occupation | Age | Diagnosis | Date | Radialis Maximum Tension in Millimeters a | b | c | d | lability |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S. W. | boy | 4 | Hypophrenosis | 9, 8, '20 | 70 | ? | ? | ? | |
| 2 | G. S. | boy | 10 | " | 10, 1, '20 | 80 | ? | ? | ? | |
| 3 | E. W. | girl | 5½ | " | 4, 16, '20 | 90 | 100 | 110 | ? | |
| 4 | W. B. | boy | 7½ | " | 4, 6, '20 | 100 | 90 | 90 | 70 | —30 |
| 5 | M. L. | girl | 14 | " | 6, 22, '20 | 100 | 100 | 100 | 90 | —10 |
| 6 | M. C. | girl | 10 | " | 4, 16, '20 | 110 | 120 | 130 | 90 | —20, 40 |
| 7 | D. W. | girl | 8 | Epilepsy | 4, 13, '20 | 110 | 120 | 140 | 90 | —20, 50 |
| 8 | A. W. | girl | 17 | Hypophrenosis | 7, 4, '20 | 120 | 130 | 130 | 100 | —20, 30 |
| 9 | G. K. | wife | 35 | Epilepsy | 9, 8, '20 | 100 | 100 | 100 | 80 | —20 |
| 10 | H. T. | wife | 48 | Psychoneurosis | 7, 30, '20 | 130 | 130 | 130 | 120 | —10 |
| 11 | F. P. | boy | 6 | Old Poliomyelitis | 10, 8, '20 | 130 | ? | ? | ? | |
| 12 | A. P. | laborer | 45 | Formerly Asthma* | | 150 | 150 | 150 | 150 | ±0 |
| 13 | A. H. | wife | 56 | Neurasthenia | 5, 14, '20 | 150 | 180 | 180 | 130 | —20, 50 |
| 14 | K. H. | girl | 13 | Pinworms | 9, 14, '20 | 160 | 160 | 160 | 100 | —60 |
| 15 | L. T. | girl | 20 | Psychoneurosis | 6, 25, '20 | 170 | 190 | 190 | 130 | —40, 60 |
| 16 | L. O. | clerk | 26 | Epilepsy | 9, 8, '20 | 180 | 210 | 230 | 150 | —30, 80 |
| 17 | J. C. | girl | 15 | Chorea | 8, 27, '20 | 190 | 210 | 210 | 110 | —80, 100 |
| 18 | M. P. | housework | 51 | Epilepsy, psychosis | 4, 16, '20 | 200 | 210 | 230 | 130 | —70, 100 |
| 19 | B. D. | wife | 54 | Psychoneurosis | 4, 16, '20 | 210 | 230 | 250 | 150 | —60, 100 |
| 20 | J. G. | wife | 54 | Psychoneurosis | 4, 16, '20 | 220 | 260 | 280 | 200 | —20, 80 |
| 21 | M. B. | vender | 32 | Chorea (influenza) | 6, 1, '20 | 230 | 240 | 210 | 160 | —70, 80 |
| 22 | H. C. | wife | 68 | Insomnia | 9, 8, '20 | 240 | 230 | 220 | 180 | —60 |
| 23 | M. B. | housework | 55 | Menopause | 6, 15, '20 | 250 | 270 | 290 | 210 | —40, 80 |
| 24 | E. B. | wife | 70 | Neuritis | 9, 8, '20 | 260 | 260 | 260 | 200 | —60 |
| 25 | J. P. | carpenter | 33 | Traumat. Neurosis | 7, 15, 20 | 270 | 270 | 280 | 230 | —40, 50 |
| 26 | C. S. | night boss | 33 | Psychopathosis | 1, 27, '20 | 280 | 280 | 310 | 200 | —80, 110 |
| 27 | K. F. | wife | 55 | Menopause, hysteriform | 9, 14, '20 | 290 | 290 | 320 | 180 | —110,140 |
| 28 | K. F. | wife | 55 | Menopause, hysteriform | 7, 23, '20 | 300 | 280 | 270 | 190 | —110 |
| 29 | A. M. | tailor | 70 | Occupation Neurosis | 9, 17, '20 | 310 | 290 | 320 | 250 | —60, 70 |
| 30 | M. C. | nurse | 64 | Traumat. Neurosis | 9, 21, '20 | 320 | 320 | 320 | 240 | —80 |

* Private case.

hand, with the basic value of test *a* on the other, the relation will be found as here summarized.

1. Test *b* value is lower than basic value *a* in 4 cases out of 26
 " *b* " " equal to " " *a* " 10 " " " 26
 " *b* " " higher than " " *a* " 12 " " " 26
2. Test *c* value is lower than basic value *a* in 4 cases out of 26
 " *c* " " equal to " " *a* " 6 " " " 26
 " *c* " " higher than " " *a* " 16 " " " 26
3. Test *d* value is lower than basic value *a* in 25 cases out of 26
 " *d* " " equal to " " *a* " 1 case " " 26
 " *d* " " higher than " " *a* " 0 case
4. In the 4 cases where test *b* value is lower than basic value *a* the difference is 10–20 mm.
 In the 12 cases where test *b* value is higher than basic value *a* the difference is 10–40 mm.
5. In the 4 cases where test *c* value is lower than basic value *a* the difference is 10–30 mm.
 In the 16 cases where test *c* value is higher than basic value *a* the difference is 10–60 mm.
6. In the 25 cases where test *d* value is lower than basic value *a* the difference is 10–110 mm.

*Briefly:* Tests *b* and *c* cause *increase* of radialis maximum tension in a majority of the cases. Test *d* causes *decrease* of radialis maximum tension in all cases but one (No. 12).

The result thus itemized may now be formulated in the following terms:

1. Afferent mechanical excitation applied to the skin at the side of the neck below the level of the ear and above acromion causes in more than one-half of the cases submitted to the test *a*, *reflex pressor effect measurable at radialis*, which pressor effect is more marked at a relatively higher intensity of the stimulus than at a lower (more marked by pinching than superficial stroking).

2. Afferent mechanical excitation applied to the ulnar nerve trunk causes in all or nearly all cases a *reflex depressor effect measurable at radialis*, which effect varies between 10 mm. and 110 mm. Hg. in the cases tested, and in the majority amounts to 30 mm. or more. In four cases out of 26 depressor reaction followed an excitation the like of which produced pressor effect in the majority of the cases tested. Why?

## III. PHYSIOLOGICAL MECHANISMS RELEVANT TO VASCULAR REFLEX REACTIONS.

In tests *b* and *c*, mechanical excitation of an area of the skin at the side of the neck deriving innervation from third and fourth segments of the cervical spinal marrow produces *reflex pressor reaction* in a majority of the cases. (An analogous experimental reaction—not considering here the effect of pressure from neoplasms, etc., upon the cervical sympathetic —is known from neurological experience in the fact that pain evoked through faradization applied to the neck causes dilatation of the pupil. This reaction is explained as starting from unknown cortical centres of pain, thence proceeding along associative paths over centrum ciliospinale in eighth segment of cervical spinal marrow, through ganglion cervicale supremum of the sympathetic system to the musculus dilator pupillae.)

The mechanisms known through experimental physiology which are principally applied in the present interpretation of the clinical angiokinetic reflex tests, may be briefly summed up as follows (1-15).

Vascular tonus is reflexly influenced by any sensory nerve. Stimulation of afferent nerves is transmitted by either vasoconstrictors or vasodilators, or both. Whether pressor or depressor effect results, depends upon predominance of the one of the other. Schematically speaking, and without considering intermediate neuronic elements, the afferent nerves engaged in tests *b*, *c* and *d*, enter the spinal marrow through the posterior roots of the spinal nerves and following the posterior columns in the cord transmit the stimuli to the vasomotor centre in the bulb (Ludwig-Thiry's centre). Here the afferent influence received is transformed into efferent influence which is transmitted from the bulb through vasomotor fibres running in the lateral bundles (mostly) of the cord, leaving the cord through the anterior roots of the spinal nerves (even posterior roots of fourth and fifth lumbar nerves contain vasomotor fibres of depressor function), thence by way of rami communicantes proceeding to the ganglion sympathetic system, whence branches go either directly to follow vessels or first unite with ramifications of the various plexuses from which branches lead to all vascular areas of the various organs. In the vessel walls the terminal ramifications of the vasomotor nerves are seen surrounding the smooth muscle cells in the tunica media forming a delicate network containing abundant minute ganglia. Depressor nerves are less demonstrated than constrictors but assumed to follow the paths of the latter. What kind of vasomotor-reflex action results from an afferent influence thus transformed into efferent influence in the bulb depends upon the (a) different kind and intensity of the stimulus, the (b) different anatomical structure upon which the stimulus is applied, and (c) the different state of the cardio-vascular tonus at the time previous to the stimulation. Electric excitation of the skin generally causes reflex pressor effect, which, as far as known, is usually and chiefly the result of vasoconstrictor stimulus through the splanchnic system of the abdominal sympatheticus affecting the vascular areas of all the abdominal organs, but may also be produced through other vascular areas. The effect of the excitation of the skin is depending upon the extent of the area of the skin upon which the excitation is applied. Excitation upon a small area of the skin may not cause reflex action, whereas excitation of an extended area of the skin, even if it is superficial and slight, may produce a marked reflex action. Electric excitation upon trunks of the nerves to the skeletal muscles causes usually reflex depressor action. Even depressor action, as far as known; is chiefly affected by vasodilatation within the splanchnic area but also other vascular areas. Vascular reflexes may extend from one side of the body to the other.

In exhausted or moribund states (*adynamic agonium*) reflex depressor activity dominates. However, the author has observed in moribund asphyxic state (*asphyxic agonium*) *reflex pressor response to excitation of asphyxia blood even few hours before exitus* (16-17).

### EXPLANATION OF THE TESTS, A, B, C AND D.

Test *a*. The requirement that a radialis-arteriotonometer must be so constructed that the compression of the artery is to be accomplished by means of a small pelotte, not larger than the palpation surface of the examiner's index finger is justified by the necessity of excluding from test *a* any and all mechanical devices by which excitation of skin or underlying structures might be produced of such extent as to evoke vascular reflexes in the moment of time at which the tension value is read. Therefore, the result of measurement of the radialis maximum tension by means of a radialis-arteriotonometer of competent construction is a *basic value* in that sense that it expresses the *actually* existing tension, *under physiological conditions*, not altered by the influence of vascular reflexes, whether pressor or depressor evoked at the time at which the reading of the tension value is made (17, 18, 19).

Tests *b* and *c* are so formulated that the reflex action evoked by light superficial mechanical stimulus (stroking), applied to an extended area of the skin, is obtained by test *b*, and by test *c* the reflex action of a pain-producing mechanical excitation limited to a small mass of the skin is obtained, both perceivable and measurable at radialis, for clinical purpose. In both tests, *b* and *c*, the mechanism is simplified by the proximity of the skin area stimulated to the posterior spinal nerve-roots through which the afferent nerves from point of excitation enter the cord, and the upper half of the cervical spinal marrow, whence the area stimulated derives its innervation; it is simplified also by the fact that the cutaneous area to which the mechanical excitation is applied, by experience referred to previously (page 6), is understood to be an anatomical structure sensitive to electric sympaticus reflex stimulation. (On the contrary, electric excitation of sixth, seventh and eighth cervical roots and first thoracic causes reflex depressor reaction.)

Test *d* is so formulated that thereby the reflex action produced by mechanical stimulation of a large nerve-trunk is made perceivable at radialis and measurable for clinical purpose. This test is reduced to simplest attainable terms by the fact that the ulnar nerve, at the point where the mechanical excitation is applied, is exposed superficially and accessible to pressure between the tip of the examiner's finger and the underlying bone without the intervention of other structures of marked excitability, that might otherwise have compromised the result. Simplicity is furthermore added to this test by the fact that by experience previously obtained it is a matter of record that electric stimulation of nerve trunks leading from brachial plexus causes reflex depressor action.

Tests *b*, *c* and *d*. It remains at this point to explain the reason for the rule given in Chapter II that in performing the tests *b*, *c* and *d* the renewed reading of the radialis maximum value, after applying the mechanical stimulus, should be made about 15 seconds after the moment of time when the stimulus is applied. The rule is so formulated because it is a physiological fact that in transformation of afferent influence in the bulb into vasomotor efferent influence the latent reaction period is estimated from two to seven seconds in man. According to personal observations of the author, the reflex vasomotor effect in some instances is volatile, speedily vanishing. In other instances, on the other hand, there is a more or less prolonged effect. The reading of the radialis maximum tension-value 15 to 30 seconds after applying the mechanical stimulus gives positive results always in test *d* (depressor), most often in tests *b* and *c* (pressor action). In such instances where no effect is perceived in tests *b* and *c*, it is possible that a volatile pressor effect has already vanished at the reading of the radialis maximum tension value. On the other hand, in such more rare instances where, through tests *b* and *c*, a depressor effect is obtained instead of the customary pressor action, the explanation is probable that the constrictor nerve and ganglia are exhausted as result of preceding prolonged continuous pressor activity in which case the pressor excitation is transformed into depressor effect. This last complication is made explicable by certain recent theories which cannot be discussed in this connection.

The possibility of exhaustion of the reflex excitability of the smooth muscle cells in tunica media of the arterioles is to be remembered in this connection as from this cause complications of the reactions may arise in asthenic states of prolonged diseases. (Acute diseases are not considered in this paper.)

## IV. SPONTANEOUSLY STABLE VASCULAR TONUS AT A RADIALIS MAXIMUM TENSION EXCEEDING 140 MM., BUT NOT EXCEEDING 150 MM. HG.

Among the cases in Table I is one (No. 12) in which the basic value of the radialis maximum is 150 mm. Hg. and in whom the several tests, *b*, *c* and *d*, do not produce any reaction sufficient to alter this basic radialis maximum value. With these facts before one's eyes, it is a mere choice of a descriptive word to say that this case possesses a *stable radialis maximum value* compared with all the other cases in Table I which under influence of the same tests are subject to more or less *alteration of the radialis maximum value.*

This case (No. 12 in Table I) has been observed by the author during about eight months, part of the time every day for several months in succession. The radialis maximum value remained the same as indicated in Table I for successive days, only with the slight exception that some days test *d* produced a reaction sufficient to depress the value of radialis to 140 m.m. Hg. However, even with this slight modification under influence of an excitation which in all other cases produces alteration, it remains true that this case, No. 12, at the time indicated, possessed a stable radialis maximum value even when comparative measurements made on successive days were considered. Moreover, six months earlier in time, this case of a middle-aged man suffering from chronic bronchitis with nocturn asthmatic attacks had developed a radialis maximum resembling the one found in psychopathic persons of the same age, a tension oscillating between 220 and 250 mm. or more, with exacerbations related to the asthmatic attacks and remissions of tension during more quiescent periods. But, for the last two months of the period of observation, the patient had not had any asthmatic attacks and during those same months he had not had medical treatment of any kind. Thus, the character of the radialis maximum tension, at the time alluded to, is, in this case, an acquisition which is spontaneously retained. Described as above, this case illustrates the state of arterial tension which in this paper is alluded to under the denotation of "spontaneously stable vascular tonus at a radialis maximum tension of 150 mm. Hg."

In an earlier publication (20), the author has presented abundant facts in support of the conclusion that a spontaneously stable radialis maximum tension, exceeding 140 mm. Hg., but not exceeding 150 mm., is identical with the *normal arterial tension.*

*Characteristics of the normal arterial tension.*

In presence of the facts referred to above, observed by the author *ab novo*, the nature of the spontaneously stable vasotonus, the normal arterial tension, appears to begin to be in some part perceivable. To say that Case No. 12 is characterized by absence of such perceivable pressor and depressor reactions as occur in all other cases in Table I, although true to fact, would not explain, describe or define the nature of the state of vasotonus which is now under consideration. The normal arterial tension cannot be adequately explained, described or defined by negative distinctions or formulations.

Just as the normal temperature of the body—formulable in exact thermometric terms—is the end result of the harmonious coöperation of innumerable mechanisms of the body and therefore defies attempts at adequate definition and description, so any attempt to describe or define the normal arterial tension must unavoidably fall short of adequacy because of the unsurveyable complexity of the mechanisms whose harmonious coöperation is the necessary prerequisite for attaining as end result the state of arterial tension which is formulable in exact arteriotonometric terms as indicated above.

At the present state of our knowledge the formula through which the normal arterial tension is expressed, *i.e.*, the radialis maximum tension spontaneously stable at a level of 150 mm. Hg., must be used, instead of definition, as the formula of identification, just as 98.6° Fahr. is the formula of identification through which the normal temperature is recognized even in the absence of an adequate definition. The description and explanation of the result contained in this formula of identification of the normal arterial tension must be left to complete itself gradually from the growth of knowledge on the subject, through continuous observation of facts, analysis of findings, and synthetic projections in the measure as such are sustainable. Thus the adequate definition will be gradually approached.

The distinguishing positive character of the radialis maximum tension in Case 12 in Table I is the *high grade of apparent resistance of the basic value of 150 mm. Hg.* This apparent resistance is a numerically perceivable expression of the *high grade of adaptability of the vasomotor mechanism* which enables it to adjust itself to variable influences from the environment, as represented by the tests, *b*, c, *d* and numerous others without loss of that reciprocal relation of constituent inner factors, *i.e.*, with undisturbed *coördination of vasomotor neurons* which expresses itself in the stable basic radialis maximum value of 150 mm. Hg., influences which in all the other cases in Table I produce disturbance in the preëxisting mutual balance of opposite pressor and depressor forces within the cardiovascular, neuromuscular mechanism. It must be very strongly emphasized, and it is hereby emphasized, that the normal arterial tension does not consist in loss of the natural reflex excitability, as might be inferred if normal arterial tension were described in terms of negation of pressor and depressor reactions in spite of such excitation as in other individuals brings out manifestations of pressor and depressor action. If the reflex excitability were lost, then a state of arterial tension were established which would be comparable with pupillary or patellar reflex-staleness, a pathological state of vascular reflex staleness; in a word, reflex angioplegia: which pathological state occurs in certain diseases as will be exemplified in a following chapter.

In view of that which has just been stated, the *normal arterial tension,* formulated in the continuously spontaneously stable vasotonus at a radialis maximum tension value exceeding 140 mm., but not exceeding 150 mm. Hg., may now be characterized as *a state of arterial tension in which the automatic and reflex excitability of the cardiovascular, neuromuscular mechanism possesses a high grade of coördination and adaptability to variable demands within wide limits, by force of which the basic radialis maximum value is balanced and retained undisturbed even though the reflex excitability is exposed to the influence of various pressor and depressor excitation.*

In a previous publication (20), the author has proven by abundant facts that the state of arterial tension which expresses itself through a spontaneously stable radialis maximum value exceeding 140 mm. Hg., but not exceeding 150 mm., coincides with non-existence of certain diseases or, in other words, that this same state of arterial tension coincides with high grade of natural immunity in relation to those certain diseases.

It follows that *a high grade of coördination and adaptability of the vascular automatic and reflex excitability to a wide range of variable demands resulting in a spontaneously stable vasotonus of normal radialis maximum tension value enters into the characteristics of high grade natural immunity.*

At this point the question presents itself whether this conclusion which is borne up by abundant facts, directly observed in nature, is also sustainable on theoretical grounds, or in other words, whether the state of spontaneously stable vasotonus as formulated and characterized above, explains or contributes to explaining, the fact of high grade natural immunity. Before entering upon this question, which must be reserved for a separate future communication, it is expedient to supplement the characteristics of the spontaneously stable vasotonus by further study of the reactions of the arterial tension. This will be done, to some extent, in the following chapters.

LITERATURE CONSULTED.

*Textbooks of Physiology*

[1] Bayliss, W. M. (1918).
[2] Burton-Opitz, R. (1920).
[3] Dearborn, G. V. N. (1908).
[4] Foster, M. (1904).
[5] Flack, M., and Hill, L. (1919).
[6] Halliburton, W. D. (1915).
[7] Howell, W. N. (1915).
[8] Luciani, L. (1917).
[9] Hough, T., and Sedgwick, W. T. (1906).
[10] Starling, E. H. (1920).
[11] Tigerstedt, R. (1914).

*Monographs and Articles on Vasomotility*

[12] Cannon, W. B., and Lyman, N.: The Depressor Effect of Adrenalin on Arterial Pulse. Am. Jour. Physiol., Vol. xxxi, 1912, 13.
[13] Gaskell, W. N.: The Involuntary Nervous System. (1916.)
[14] Porter, W. T.: Chapter on Vasomotility in Am. Syst. of Physiol.. (1908.)
[15] *Idem.:* The Functional Relation to the Nerve Cells in the Vasomotor Centre. Proceed. of the Am. Physiol. Soc., 25th ann. meet., 1912, 13.
[16] Enebuske, Claës Julius: Jakttagelser angaende blodtrycket hos lungtuberkulos lidande personner. Nord. Med. Ark., 1912, II, 13.
[17] *Idem.:* Hygiea, Stockholm, July, 1911.
[18] *Idem:* Om den Kliniska blotrycksbestamningens teknik. Nord. Med. Ark., 1912, II, 13.
[19] *Idem.:* Münchener Medicin. Wochenschr., 1912, 12.
[20] *Idem.:* On the Normal Arterial Tension. BOSTON MEDICAL AND SURGICAL JOURNAL, March 6, 1919.

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# FECAL UNITS AND INTESTINAL RATE, A BASIS FOR THE STUDY OF HEALTH AND INTESTINAL INDIGESTION.

BY FRANCIS LOWELL BURNETT, M.D., BOSTON.

*(Concluded from page 376.)*

## INTESTINAL RATES.

These minor features undoubtedly have some significance in the action of the intestine on its contents; and the variations may be due in part to the great variety of food ingested by man, because the units of animals consuming very much the same kind of food day by day are much more uniform in size. But with man the variation is undoubtedly correlated to another factor; and that is intestinal rate. In this work intestinal rate means the shortest time in hours for a substance to pass through the alimentary tract, and a few estimates according to this definition may be cited. Paton says that food may remain in the intestine of ruminants for five days (120 hours[9]). Elliott and Barclay-Smith gave a rabbit some colored beads, which they first found in the dung in 24 hours. The observations on man vary considerably. Hertz, by means of the bismuth meal, says the time depends somewhat on the time of ingestion and defecation, and therefore gives a rate of from 9 to 32 hours.[10] Straus by using carmine gives 12 hours as the minimum rate and 47 as the maximum for normal limits.[11] And Case states that the colon should be emptied of barium by the thirty-sixth hour; but in what he calls a spastic colon some of the barium meal may be held in the proximal colon 50 hours after ingestion, as shown in Figure 14.[12] And Barclay[13] says "one sees so many instances of women in whom the opaque meal takes 48 hours or more to reach the rectum."

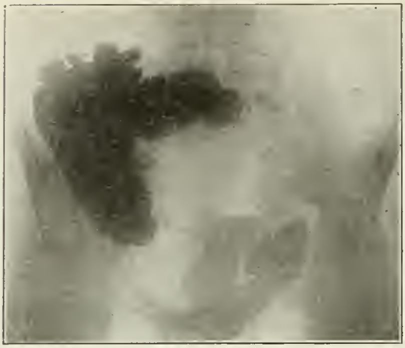

Fig. 13.—An x-ray photograph of the human colon after the ingestion of a barium meal. Note what appears to be a closure of Cannon's ring, by which the contents of the gut are held back in the proximal colon by waves of antiperistalsis, as in animals. (The print is used through the kindness of Dr. James T. Case, Battle Creek, Mich.)

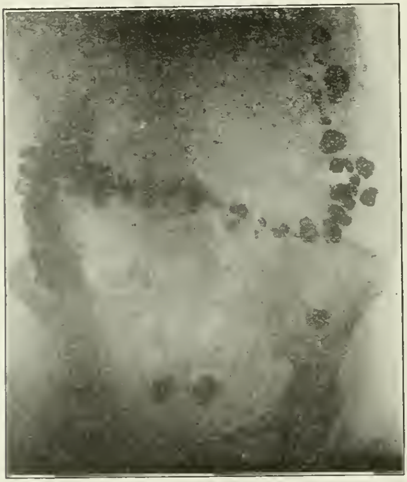

Fig. 14.—An x-ray photograph of the human colon 50 hours after the ingestion of a barium meal. Note the change in the contents at Cannon's ring, where the column of food is formed into small boluses (units) that are being carried through the distal colon as in animals. (The print is used through the kindness of Dr. James T. Case, Battle Creek, Mich.)

In the individual under observation, several substances have been used to determine the intestinal rate. In an attempt to make the estimates more accurate, a different substance was given after each of the three meals; that is, rape seed was taken at 8 A.M., charcoal at 2 P.M, and millet seed at 8 P.M.; but with a slow intestinal rate the three substances are so commingled in the feces that it is difficult, not to say impossible, to recognize any one of them before the others. Then, too, charcoal seemed at times to cause an unnatural retardation of the rate, so that for most of the tests millet seed alone was used. This seed is not unlike that of tomatoes and berries, foods that are frequently ingested; and it is readily recognized as white dots in the dark brown field of the feces (Figure 10). Of this a measure of 30 cc. was mixed with half a tumbler of water, and gulped down at 2 P.M., on a Tuesday for many weeks; then the stools at 10 A.M. and usually 3 P.M. on the following days were examined for the seed and the time noted when they were first apparent. In this way the following figures represent the number of hours intervening between the time the seed were taken and the time of their first appearance in the feces: 73, 85, 39, 44, 39, 61, 39, 61, 39, 49, 49, 44, 39, 73, 44, 39, 44, 68, 44, 50, 63, 39, 44, 68, 73, 68, 73, 25, 39, 68, 68, 44, 73, 73, 49, 68, 73, 20. To put these estimates in order according to the decimal in which they occurred would be as follows:

25, 20.
39, 39, 39, 39, 39, 39, 39.
44, 49, 49, 49, 44, 44, 44, 44, 44, 44, 49.
50, 56.
61, 61, 68, 63, 68, 68, 68, 68, 68, 68.
73, 73, 73, 73, 73, 73, 73.
85.

As the stools associated with a rate below 40 hours are not entirely composed of units (Figure 10), the rate appears to be abnormally rapid; and an average of the remaining estimates is 64 hours. This figure represents the time the seed were first seen; but they continue to be apparent in the feces for 120-144 hours (5-6 days) after the time of ingestion. And while it seems possible to get an estimate of the rate of an abnormally rapid dejection from a consideration of its character, it is also apparent that those entirely composed of units are a fairly accurate index of whether the mass represents food that was 80 hours, 40 hours or 60 hours, in its passage through the body. For a stool made up of units which separate on dejection, like Figure 7, represents a very slow intestinal rate; one like Figure 8 is associated with one that is more rapid, or 60 hours; and finally one composed of indefinite units (Figure 9) is found, with a rate that is somewhat more rapid. The rate for this individual of about 60 hours appears to be normal; for in a few subsequent dejections at a more rapid rate, the units not only vary in size, but many of them are undersized or immature. This point, however, is better illustrated after the dejection of a specimen showing an accelerated intestinal rate. Such a specimen is shown in Figure 10. The first portion is composed of well defined units of a regular size, in the intermediate portion they are indefinite, and at the end the mass containing most of the millet seed is foul and formless. This specimen represents a premeditated attack of intestinal indigestion (according to this definition). Millet seed were given at 2 P.M. on a Tuesday. At Wednesday's supper an excess of sugar in the form of syrup candy and jam was ingested, and on Thursday morning at 10 o'clock this large mass of feces was dejected. For a few days following, sweets were avoided, with the result that all of the food taken into the body was retained until Saturday morning at 10 o'clock, when the mass illustrated in Figure 11 was excreted. This stool is small, and while it is entirely composed of units, they are small and undersized. Such a sequence of events with these characteristic stools has been observed many times; accordingly, it seems that the gut at a slow or what appears to be the normal intestinal rate of about 60 hours contained a certain amount of aliment; but when the rate is accelerated and an excess of the intestinal contents is dejected, the gut afterward retains all of the food, if suitable, until it is normally replete, and then the additional amount is formed into units, passed along and dejected. In general, then, while the individual under study has an intestinal rate that varies somewhat, the stools associated with those above 40 hours are entirely composed of units, but the dejections at a slower rate of about 60 hours, are formed of units of a uniform size day after day.

### THE MOTILITY OF THE HUMAN COLON.

The action of the human colon on its contents has not been observed directly as in animals; but the motility has been studied extensively by means of the bismuth meal and x-ray. In this way Case has made many observations, and he has divided the large gut into the same physiological parts that have been made for the lower animals; that is, the ring of Cannon in the transverse colon divides it into the proximal and the distal portions. He also states that his observations have almost to the minutest detail confirmed the work of Cannon on animals. The prevailing movement in the proximal colon is antiperistalsis, which consists of a movement of waves backward toward the caecum, as shown in Figure 13. In this illustration the column of food is seen to be held back by waves of antiperistalsis in the proximal colon, thus accentuating the constricting ring of Cannon. The characteristic activities in the distal colon are churning and onward movements. Haustral churning, the name given to one of the forms of motility, Case describes as segmentation, which is similar in many respects to the rhythmic segmentation in the small intestine. The onward movements, on the other hand, take place in two different forms; the mass movement of Holzknecht, by which a sausage-shaped mass travels along the gut with great rapidity, and the slow, propulsive movement of Fischl and Porges, by which "small boluses the size of a pigeon's egg travel slowly down the descending colon into the pelvic colon." The former movement is without analogy in the activities of the colon of animals, and may be abnormal; but the movement by which small boluses the size of a pigeon's egg travel down the descending colon seems to simulate in every respect the observations already described of animals, by which units formed in the intermediate colon are propelled onward through the distal colon by waves of peristalsis. Figure 14 graphically illustrates this activity. The food column is seen intact up to a point where Cannon's ring or the intermediate colon is likely to be; and from there onward it is broken up into units or small boluses which appear to be travelling down the distal colon. A point, however, of this figure that should be emphasized is that it was taken 50 hours after the ingestion of the barium meal. In other words, this picture portrays the colon with a slow intestinal rate, which Case describes as a spastic colon. In these cases, too, he finds the capacity of the proximal colon as measured by a barium meal, larger than normal; but the distal part of the gut has a smaller capacity. It is evident, therefore, that the action of the human colon may be even more complex than that of lower animals; and not only may the aliment be delayed in the proximal colon by a closure of the constricting ring and antiperistalsis, but along the distal colon the contents may also undergo haustral segmentation. Perhaps these processes mould or mark the intestinal contents so that the functions are recognized in the character of the feces: or is it possible that units are a sign of antiperistalsis, and the lines on them an indication of haustral segmentation? Yet, regardless of the result of these activities, they must serve some useful purpose, and it is difficult not to believe that they form a means to increase the amount of absorption and nutrition to be obtained from the food.

### THE CHARACTER OF THE FECES AND DISEASE.

If the form and marks of a stool composed of units express some function of the intestine; then the great variation of the character of the human feces must be of even more significance. Such a variation makes a division difficult, for a single dejection may in part present points of one type and in part those of another; yet each one is predominantly typical, and may be so classified. For convenience in discussion, suppose there are three types; first, the semi-fluid and very foul stool of diarrhea; secondly, the foul and formless—a common dejection, and finally, one entirely composed of units. Diarrhea is an abnormal condition and is frequently due to the ingestion of improper food, and in one condition of disease is due to insufficient[14] mastication of the food. On the other hand, the continued dejection of fecal units appears to require care in the selection of food, and thorough comminution to prepare it for digestion. One has an intestinal rate of less than 20 hours, the other one of about 60; therefore the foul and formless type having characteristics between these extremes seems likely to be due in a lesser degree to some of the causes of diarrhea. But another point in the comparison is the odor. The offensiveness and stink of organic matter is generally an accurate index of decomposition or putrefaction. The odor of a semi-fluid stool is usually very offensive; that of the foul and formless is stinking; whereas that formed entirely of units is not disagreeable. Furthermore, in the investigation of a few individuals, Folin and Denis[15] have found that the phenols, which give the most accurate index of the degree of putrefaction of the intestinal contents, are increased in the feces in diarrhea and after the administration of laxatives or enemata. Therefore, the semi-fluid and the foul and formless stools are evidently associated with an excessive degree of putrefaction and decomposition, in comparison to one composed entirely of units. The final point in the comparison, however, is the most striking, and that is the relation between the form of the feces and disease. To look at the units dejected by the rodents (Figures 1 and 2) and consider their form, one is immediately impressed by their exact outlines and contours. Those of the guinea pig, for instance, are equally long, of the same circumference, and have very much the same outlines. Such exact forms must be the result of some natural action—some function; and as they represent the final moulding of the intestinal contents, they must also be an expression of the complete action of the intestine. And besides, as they are invariably dejected by this animal, these units of dung must be normal. The same may be said of the dung of the rabbit, the horse, the sheep, the pig, the monkey, and without doubt the dung of many animals not yet observed. Therefore, it is inconceivable to believe that feces entirely composed of units dejected by the highest type of animal or man, as shown in Figure 8, can bear a different interpretation. But in Figure 10 a dejection of a mixed type is illustrated. One part is formed of nicely divided masses, with evenly rounded contours and a smooth surface, whereas the other is composed of a solid mass without any marks or subdivisions and a rough surface. One portion bears the ear marks of a natural action, while the other appears abnormal. But if disease is defined as "any derangement of the vital functions in which their natural action is interrupted or disturbed, and causing or threatening pain and weakness, morbid or unhealthy condition; malady, distemper[16] or sickness," the foul and formless stool or, indeed, one illustrated in Figure 10, showing an interruption of one of the vital functions, is a sign of disease. And a definition given in Osler and McCrae[17] is peculiarly applicable to this condition. "In a broad sense, intestinal indigestion is a term denoting any form of interference with normal intestinal functions, but it is more properly restricted to functional derangements, rather than such as may attend organic disease." From these definitions the foul and formless stool, not only showing a disturbance of a natural action, but also—what appears to be a derangement of the normal intestinal functions—is an indication of disease, intestinal indigestion.

### INTESTINAL INDIGESTION AND AUTO-INTOXICATION.

If fecal units serve as a sign in the determination of intestinal indigestion, it is interesting to consider the action of the gut in what may be the normal condition; and then what occurs in this disease. In this comparison it appears as if there were two contending forces in operation for the benefit of the individual; one, the normal, which tends to retard the intestinal rate, so that the intestinal contents pass through their complement of action and the body derives all of its proper nourishment, and the other, the abnormal, in which food incompatible with the bodily requirements or transformed into deleterious substances, is rapidly passed through the intestine at an increased intestinal rate, to prevent the body from extreme injury. Such a slowing of the intestinal rate is commonly thought of as an indication of stasis, stagnation of the intestinal contents, and auto-intoxication. Case, however, refutes such a conception, and says "that the terms, alimentary toxemia and intestinal stasis are not synonymous is self-evident. Some patients may show evident intestinal stasis without exhibiting any signs of toxemia. Other patients with only a slight stasis may be intensely toxic, while in still other patients with a high grade stasis, there may be only slight toxicity." In this way, too, it is perfectly evident that the use of oil or cathartics in those with an excessive putrefaction of the intestinal contents, will increase the rate and the elimination of the deleterious substances arising from this process, and probably alleviate some of the conditions of disease due to these poisons; but at the same time there will be a decrease in the amount of nourishment available. Intestinal indigestion due to foods incompatible with the bodily requirements appears to be due to the ingestion of an excess of sweets, fats or fruits or a combination of all three; in fact what may simply be called too much rich food. If this condition is acute according to the individual under study, there may be only vague abdominal pains probably due to gas; a loss of appetite and the customary relish for food; and, of course, irregular dejections for a day or two. And occasionally a head cold has followed in the course of three or four days after such a disturbance. On the other hand, it is difficult to guess at the effect on the body of the continued dejections of the foul and formless stool; unless it be a vague sense of weariness or exhaustion, headaches, and such indefinite symptoms. But when the food is transformed by excessive decomposition or putrefaction, autointoxication is likely to be the result; and the continued absorption of these poisons for a period of years or decades is supposed to cause a structural change in some of the cells of the body. Such a description is simply a brief review of the effects of this form of intestinal indigestion; and while it is primarily a disease of the alimentary tract and seems likely to be a factor in many of its disturbances, the loss of nourishment combined with the toxemia seems likely to give rise to as many diseased conditions as syphilis in its secondary and tertiary stages. Indeed, in an exhaustive study of autointoxication, Anders[18] considers that catarrhal colitis, dilatation of the stomach and enteroptosis are some of the disorders of the gastrointestinal tract supposed to be due to this form of food poisoning. Anemia, hypertension, and arteriosclerosis are some of the vascular conditions which suggest this cause; in faulty metabolism, as rheumatism, gout, diabetes, and obesity, some rather convincing evidence has been obtained; also asthma, emphysema, migrane, neuritis and neurasthenia are mentioned; and finally, lesions of the skin, as urticaria, eczema, and psioriasis seem to be due especially to the toxemia arising from the intestinal contents; and these factors acting separately or together may be the cause of many secondary conditions of disease. But this form of indigestion is readily recognized by the character of the stools, when fecal units are applied as a sign of health.

### FECAL UNITS ARE ASSOCIATED WITH A HEALTH CONDITION OF THE BODY.

The food of man is so varied and of such a complex composition that acute attacks of intestinal indigestion are difficult to avoid occasionally; and these are graphically illustrated in the estimates below 40 hours in the series of intestinal rates previously reported. Only a few of the rates of 39, 25 and 20 hours were the outcome of forethought and were produced to confirm some point in the experiments. But to strive for health, the object should be dejections entirely composed of units day in and day out, year in and year out; and from the experience of the individuals studied, the habits to be formed are not very difficult to form and control. But the stool only must be the guide; and if on one day the intestinal rate appeared to be too rapid and a portion of the stool is composed in part of a foul and formless mass, the food considered responsible for the indigestion should be avoided; and in the course of a few days the rate will again become retarded and the stools composed entirely of good-sized units. Such a practice has been carried on by the individual under special study for a period of about ten years; and during this time only an unusual degree of well being has been experienced. The same may be said of the children, although the period of observation has been less than a year. Ordinarily, a stool composed of units is considered by many as a sign of constipation or even obstipation. But that this is not so with the individuals under study is shown by the fact that two movements a day are the rule, if the intestinal rate is sufficiently slow. And in view of a different conception of the action of the intestine, there should be a new conception of some of its disorders and especially constipation. This is because the normal intestinal rate and the character of the stool must be taken into account in every case; instead of holding to the inherited theory alone that it is normal and natural to defecate once a day, and if regularly performed all is well. Occasionally, however, in the man, there has been an abnormal retardation of the rate; and an enema was considered of value, but a laxative has never been found necessary. After an attack of indigestion there has been a loss of appetite and of the customary relish for food; but only for a short time, for when the rate became right again, both sensations returned. Nausea, belching, distress or fullness after meals, diarrhea, headaches, or a feeling of lassitude; in fact, none of the minor symptoms of ill health have been experienced. The sleep has been sound, refreshing, and free from dreams; and the weight of the body has remained constant within a few kilos, and a slight loss occurring during the summer being evidently due to an increase of muscular exercise. And the body has been capable of an unusual degree of physical and mental exertion. Accordingly, a few individuals on a basis of fecal units are unusually healthy. And if this form of stool is associated with a slow intestinal rate to complete the cycle of digestion, absorption and nutrition, a more critical study must be given to constipation, and the standard requirement of a daily evacuation looked upon with a less dogmatic and a more intelligent point of view.

## FACTORS INFLUENCING THE FORMATION OF UNITS.

Units are formed in animals in the intermediate colon by the opening and closing of the constricting ring, as the pultaceous mass in the proximal colon is moved onward. A similar process seems likely to occur in man from an examination of the intestinal contents in Figure 14; but a closure of the ring, after the contents of the small intestine has been emptied into the proximal colon, appears to be the most essential factor. For if the ring remains open, the contents of the large intestine seem to be merely passed along rapidly by peristalsis and perhaps the mass movement of Holzknecht, and dejected in the foul and formless stool. But when the ring closes, antiperistalsis takes place; there is a delay in the passage of the aliment, discrete masses are formed, and dejected in a stool entirely composed of units. From what is known of the influences affecting intestinal motility in animals, the character of the food is undoubtedly a very essential consideration, and from the experience of the subject under study, this influence also seems to be the most important factor in closing the ring for a reverse passage of the contents in the proximal colon. While the food undoubtedly plays the most important part, the bacterial flora developing in the large intestine as a result of the character of the mixture, may have a secondary influence on the motility of the gut. The mixture entering into the proximal colon can be changed in several ways: thus the times of eating will affect it, the amount of food ingested will exert some influence, also the way the food is prepared for digestion and the proportion of the different elements will cause a change, and finally the number and time of emptying the bowel may have to be taken into account. These considerations have only to do with the habits of an individual; and those formed to elicit the complete action of the gut are entirely consistent with a simple and wholesome mode of living. Three meals should be sufficient for all adults, although a fourth meal four or five hours after the evening meal may occasionally be of value to induce sleep. But habitually eating between meals, as afternoon tea and refreshments in the evening, probably does more harm than good. At these times there should not be a demand on the body for nourishment and an excess of food is ingested. Only two meals a day may be of value for those that are excessively fat: one in the morning at 10 or 11, and another in the evening at 6 or 7. This practice, besides diminishing the amount of food ingested, forms a decided break in the habits of the individual, and is likely to be a factor in correcting other faulty ways of eating. The worst habit, perhaps, is eating too fast. By this fault, too much food is likely to be consumed; and as it is not properly prepared for digestion, it would seem as if the uncomminuted lumps not having been thoroughly mixed with, or protected by, the digestive juices, formed a favorable medium for a peculiar or excessive putrefaction within the intestine. This point is especially emphasized by McKenzie, who says, "the great importance of oral digestion is not sufficiently appreciated. Not only does the process of mastication in several subtle ways stimulate the digestive glands, but the juices from the mouth which are mixed with the food not only assist digestion, but prevent the flatulence which is so often a troublesome feature in the weakened digestion of heart failure."[19] Comminution of the food merely prepares it better for digestion; and this process is aided by prescribing a dry diet of crackers, toasted bread, and muffins, and cookies. But a carbohydrate diet, no matter how much it is chewed, is evidently insufficient for the entire requirements of the body; and a good proportion of animal protein seems essential. Support for this assertion not only shows the character of the teeth and alimentary tract of man to be omnivorous, but also physiologically; for if units are formed in the feces at all on a carbohydrate diet, they are small and indefinite. Although a good proportion of the essential foods is necessary, care must be exercised in the ingestion of rich foods; and an excess of sweets, fats and fruits, or foods having a tendency to unduly increase the intestinal rate, must be avoided. This point has been taken into account by pediatricians, in the treatment of the diarrhea of infancy; as the sugar is invariably eliminated in changing the formula. Fresh and cooked fruit, but without an excess of sugar, are of value in keeping the intestinal rate from becoming too slow. Observations on the coarse foods, such as the bran breads and many vegetables have been limited; but they do not seem to have an influence one way or another. Individuals vary in the amount of food consumed as well as the amount of nourishment necessary, consequently the amount of residue to be excreted will vary. Ordinarily, however, when the rate is sufficiently slow, two stools should be the rule every day; and these should take place at least half an hour after two of the meals, in order that the dejections represent the surplus of absorbable material to be removed from the gastrointestinal tract. The influence of muscular exercise on the formation of units and the intestinal rate is difficult to interpret; but in all probability the rate is increased by it. Such an observation is in accord with the condition of the dung of a horse after a long drive, when the dejections are frequent, soft, and formed of indefinite units. On the other hand, the loss of sleep seems to retard the rate. About eight hours sleep seems to be sufficient for an adult; and during the waking hours the mind should be properly exercised with an interest or work. Therefore, as it is possible to change the foul and formless dejections of intestinal indigestion to those entirely composed of units, the requirements necessary form the basis of treatment. Such a basis consists largely of correcting improper habits of eating; and those acquired merely conform to a sensible and wholesome mode of living.

## CONCLUSION.

In animals, digestion and absorption are varied and complex processes. The food necessary for the proper nourishment of the body is delayed along its course in the stomach and proximal colon. But when the food is not suitable, it fails to bring into play the complete action of the gut; and as the carbohydrate meal in the stomach of a cat, it is rapidly passed on. In this way the stomach exhibits selective action; but the proximal colon appears to be even more sensitive to influences of this kind; and as its complete action is readily discerned in units formed in the dung, the normal digestion is readily distinguished from the abnormal. Similarly, in man the intestine has rates of motility and retardation, as well as periods of slow propulsive movement and discharge. Such complex acts must have some purpose; and it is difficult not to believe that they increase the amount of absorption and nutrition to be derived from the food. And their action seems to depend on the character of the mixture entering the proximal colon; for if the aliment is compatible with the needs of the body, it undergoes the complete mechanism of digestion; but if the mixture is too rich, if the proportion of the different elements is not right, and if it is not properly mixed and protected by the digestive juices, it will either be passed along rapidly and dejected, or decomposing, will also give rise to injurious substances. In one case, there is a reversed action of the gut and a retardation of its rate, after which the aliment is formed into units and excreted in the normal feces, and is a sign of health; but in the other, when the aliment is not in a suitable condition to be absorbed by the body, it fails to elicit some of the functions of the intestine, is discharged in the foul and formless stool, and is a sign of intestinal indigestion. Thus Nature, on the one hand, wise, makes a two-fold use of a portion of the gut to increase the animal economy; but on the other hand, beneficent, rapidly carries away substances that are incompatible or may be harmful to the body, and the health of the individual lies in the balance.

REFERENCES.

[1] Mackenzie, J.: The Future of Medicine. Henry Frowde, London. 1919. 993-199.

[2] Councilman, W. T.: Disease and Its Causes. Henry Holt & Co. 1913.

[3] Burnett, F. L.: Fecal Form. BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxvii, No. 16, pp. 574-576, April 17, 1913.

[4] Schmidt, A., and Strassburger J.: Die Fazes des Menchen. Hirschwald, Berlin. 1915.

[5] Cannon, W. B.: The Movements of the Intestines Studied by Means of the Roentgen Rays. Am. Jour. Phsyiol., Vol. vi, p. 251, January, 1902.

[6] Elliott, J. H., and Barclay-Smith, H: Antiperistalsis and Other Muscular Activities of the Colon. Jour. of Physiol., 1904, Vol. xxxi, p. 272, June 30, 1904.

[7] Cannon, W. B.: Further Observations on the Movements of the Stomach and Intestines. Proceedings of the American Physiological Society, 1902.

[8] Cannon, W. B.: Verbal communication.

[9] Paton, D. Nöel: Essentials of Physiology for Veterinary Students. Chicago. 1905.

[10] Hertz, A. F.: Constipation and Allied Intestinal Disorders. Henry Frowde, London. 1909.

[11] Strauss, H.: Arch für. Verdaaungs. Krankheiten. 20. 1914.

[12] Case, J. J.: Basic Considerations in the Roentgen Study of Intestinal Stasis. Penn. Med. Jour. Athens, 1915, Vol. xviii, pp. 683-704.

[13] Barclay, A. E.: The Alimentary Tract. The MacMillan Co., New York.

[14] Hewlett, A. W.: Monographic Medicine. D. Appleton & Co., New York, 1916, Vol. i, p. 191.

[16] Folin, O., and Denis, W.: The Relative Excretion of Phenols by the Kidneys and by the Intestine. Jour. Biol. Chem., 1916, xxvi.

[16] Webster's Dictionary: G. & C. Merriam & Co., Springfield, 1881.

[17] Osler, W., and McCrae, J.: Modern Medicine. Lea & Febiger, Philadelphia and New York. 1914.

[18] Anders, H. S.: Intestinal Autointoxication. Forshheimer's Therapeusis of Internal Diseases. D. Appleton & Co., New York and London, 1914, Vol. ii, pp. 664-682.

[9] Mackenzie, J.: Principles of Diagnosis and Areatment in Heart Affections. London, Frowde. 1916.

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THE ASSOCIATION FOR INTERNAL MEDICAL SERVICE will hold a meeting at Boston University (Room 22) corner of Boylston and Exeter Streets, Monday, April 25, 8.00 P.M. Dr. Horace Packard of Boston, recently returned from the Orient, will give an informal travel-talk, illustrated by stereopticon. The public is invited. ANITA S. WARD, *Secretary*.

## MEDICAL REGISTRATION IN MASSACHUSETTS

The following table shows the results of the March examination of applicants for medical registration in Massachusetts:

| MEDICAL SCHOOL ISSUING DEGREE | NUMBER APPLYING | REJECTED | APPROVED |
|---|---|---|---|
| College of Physicians and Surgeons, Boston | 4 | 4 | |
| Mass. College of Osteopathy | 3 | 3 | |
| American College of Osteopathy, Kirksville, Mo. | 2 | 2 | |
| Middlesex College of Medicine and Surgery | 8 | 6 | 2 |
| University of West Tennessee | 1 | 1 | |
| Baltimore Medical College | 1 | 1 | |
| Emory University Medical School, Ga. | 1 | 1 | |
| Hahneman College of the Pacific | 1 | 1 | |
| Laval | 1 | 1 | |
| Columbia | 2 | | 2 |
| Johns Hopkins | 1 | | 1 |
| Maryland Medical | 1 | | 1 |
| University of Maryland | 1 | 1 | |
| Imperial University of Russia | 1 | 1 | |
| University of Helsingfors | 1 | 1 | |
| Tufts Medical School | 2 | 2 | |
| Syrian Protestant Medical College | 2 | | 2 |
| Rush Medical College | 1 | | 1 |
| French Medical School Beyrout | 1 | | 1 |
| University of Constantinople | 1 | 1 | |
| Harvard Medical School | 1 | | 1 |
| University of Naples | 1 | 1 | |
| University of Lisbon | 1* | | |
| American Medical Missionary College | 1 | | 1 |
| Jefferson, Phila. | 1 | | 1 |
| Edinburgh University | 1 | | 1 |
| Kansas University | 1 | | 1 |

* Result not determined.

◆

MEDICAL EDUCATION BILLS NOT ADOPTED.—It is disappointing to report that the bills relating to medical education, endorsed by the joint legislative committee of the Massachusetts Medical and Homeopathic Medical Societies, have been adversely acted upon by the Legislature. One provided for a pre-medical education equivalent to two years in a college of liberal arts, and the other for service as an interne before applying for registration. The bill giving authority to the Board of Registration to secure expert assistants in conducting examinations, is in a fair way to be enacted into law, but the provision of paying for such assistants was stricken out. This may render the bill impotent, unless appropriation may be secured through the supplementary budget.

THE BOSTON
**Medical and Surgical Journal**
*Established in 1828*

THURSDAY, APRIL 21, 1921

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

For three years Homer Gage, M.D., *Chairman*
Edward C. Streeter, M.D.
Edward W Taylor, M.D.
For two years William H. Robey, Jr., M.D.
Roger I. Lee, M.D.
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## THE MASSACHUSETTS MEDICAL SOCIETY ASSUMES OWNERSHIP OF THE JOURNAL.

With this issue, the Boston Medical and Surgical Journal enters upon another cycle in its history. It is now owned by the Massachusetts Medical Society. Delay in assuming the management was due to lack of authority in the charter. An amendement has recently been authorized by the Legislature and the enabling bill has been signed by the Governor.

The purpose of the advocates of this new function of the Society was to endow the Journal with the authority of this influential society. In adopting the recommendations of the proponents of this measure, the Council endorsed the ambitions of those who, having feared the gradual overshadowing of medical publications in this section of the country by larger periodicals, hold to the belief that a New England medical journal, maintained by New England energy and acumen, may have influence on medical progress. The quality of work done by master minds in New England will continue to have avenues through which the profession may be conveniently reached. The history of the Journal is creditable, for it has reflected the unselfish interest of public spirited persons and able contributors, who have maintained it for many years. But because of the probability of interesting groups of men, willing to carry the burden indefinitely seemed so doubtful, careful consideration led to the conviction that a medical society could properly take on the functions of insuring the continuance of this publication. It is recognized that some members of the Society may feel that the financial burden may be considerable. To this objection, the answer may be made that the Society is more than a medical club. It was founded on the principles that, "Health is essentially necessary to the happiness of society," that "its preservation or recovery are closely connected with the knowledge of the animal economy and of the properties and effects of medicine," and that, "the benefit of medical institutions founded on liberal principles is universally acknowledged," hence the main purpose of the Society should be to promote the preservation and recovery of the health of the people. The social features are incidental and a means to an end, so that the Society may properly strive in the broadest way to bring the achievements of medicine to the attention of all practitioners and disseminate knowledge of the facilities of hospitals for instruction of students, as well as treatment of the sick. In addition to matters of interest in daily routine, there must always be up for discussion questions relating to legislation and ethics affecting the profession and the people. To meet these various problems, a local periodical, managed by those in touch with local conditions, is a necessity. If there be objection to this plan of society ownership of a journal, one may ask the critic to imagine the conditions that would probably exist if there should be no literature representing New England medicine. One may safely assert that there would be less and less of community interest. The profession would be more inclined to divide itself into cliques with lack of confidence in and coöperation with one another, and hence a degree of stimulating influence and honorable competition would be lost. This section would become provincial in thought and practice, except for a comparatively small group of progressive men who would find congenial associations in the larger cities. If these possibilities are to be avoided and the Society is to fulfill its mission, it must not only maintain a journal, but it must make that journal a power.

Every member has a definite responsibility. The Journal will express opinions, not in a dogmatic way, but rather with the intent that questions of policy and professional activity may have careful consideration and judicial treatment.

The assistance of every member of the Society is cordially solicited. With this coöperation, the committee in charge has faith in the future of the Journal.

(Quotations from the Charter of the Society.)

## THE COMING EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold its first examination in Boston, June 14 to 21, as announced elsewhere in this issue of the Journal. This event should be of special interest to the recent graduates in medicine in this vicinity. The certificate granted by the Board to successful candidates is accepted by Army, Navy, and Public Health Service in place of the professional entrance examination for these services; it is accepted officially by medical examining boards of twenty states in place of their own professional examination; it is practically so accepted in a dozen other states, including Massachusetts, which are legally obliged to hold some form of examination for licensure; it is accepted as qualification for admittance to the Graduate School of the University of Minnesota, including the Mayo Foundation; and the Conjoint Examining Board of England and the Triplicate Examining Board of Scotland have recently granted the greatest recognition legally possible to them,—admission to their final practical examinations. It is confidently expected that in the near future, this certificate will be accepted as evidence of qualification to practise medicine by all licensing bodies in the United States and Canada. Aside from its relation to licensure to practise medicine, the certificate of the National Board of Medical Examiners is receiving growing recognition as evidence that its possessor is especially well trained in the science of medicine—a distinction which will have an increasing importance in the future. This will, perhaps, be its greatest value and should be an incentive to all qualified graduates to apply for examination.

An additional reason for trying this particular examination is the fact that it will be the last examination held under the present plan, with no fee except the nominal charge of five dollars for registration. After this examination, the National Board will inaugurate a new plan, which subdivides the examination into three parts, and, as this work must be placed upon a self-supporting basis, a total fee of one hundred dollars will be required for the whole examination,—twenty-five dollars each for Parts I and II, and fifty dollars for Part III, the final practical examination.

It has been the experience of the Board in inaugurating its examination in a new place, that many eligible physicians hesitate to take the examination, because of the requirement of laboratory examinations in the fundamental medical sciences,—apparently expecting the same kind of examination that would be given to students who had just completed these courses. It is believed that anxiety on this point is not warranted in the case of the recent graduates from good medical schools, since it is the aim of the Board to test the training of candidates in these subjects chiefly on topics which have a practical application in the practice of scientific medicine. Those who feel inclined to defer examination for a better opportunity to brush up, may well consider the contemplated increase in the fee, and the fact that a candidate entering the examination under the present plan is entitled, if he fails in this examination, to a second examination after the lapse of one year, on the payment of the registration fee of five dollars.

Eligibility for examination may be established on the basis of a four-year high-school course: two years of acceptable college work, including physics, chemistry, biology, and a modern foreign language; graduation from a Class A medical school; and one year as interne in an acceptable hospital or laboratory. Under the present ruling of the National Board, candidates are accepted after nine months of interne service, and applications will be received and given consideration after six months of interne service. In the case of candidates accepted before the completion of one year of interne service, the certificate will be withheld until the Board receives evidence of the satisfactory fulfilment of this requirement.

## NON-RESIDENT MEMBERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

THE Treasurer of the Society has called attention to a serious problem relating to the annual dues. There are members of the Society now living in places remote from New England, who have no opportunity of participating in the affairs of this section and yet, because of early association, desire to retain membership. Such members properly feel that the large dues which only carry the privilege of having the JOURNAL, are burdensome. An amendment to the by-laws might be adopted which would permit those who cannot attend meetings because of living at a distance, to retain a form of membership which would insure receipt of the JOURNAL.

The attention of the Committee on membership and Finance is respectfully called to this suggestion.

## MALPRACTICE LIABILITY INSURANCE RATES ADVANCED.

A CIRCULAR letter, distributed by the Ætna Life Insurance Company, gives notice that premium rates on physicians' and surgeons' Malpractice Liability Insurance are to be increased about 300 per cent, owing to the large number of claims and losses to the companies.

In the Middlesex South District Medical Society, a large number of physicians have taken out insurance. This is surprising in view of the fact that the Massachusetts Medical Society has provided for the defence of malpractice suits, and the records show that the results are favorable as compared with actions defended by commercial insurance companies. It is a well-known fact that lawyers are more successful in trials where the prosecution is directed against a corporation which must pay the amount awarded by a jury.

The Ætna Company has been selling group insurance at $13.50 per person. Under individual policies the rate, after April 1, will be $45. The group rate will be increased to $40. There have been verdicts rendered against physicians recently which have seemed to stimulate people to enter suits against physicians.

The function of the Society in defending these suits may be studied to advantage by the members. It is possible that the provision whereby the Society defends suits may not be generally known. It may be that physicians prefer to pay for insurance in order that the award of the jury, if any, be met by the insurance company, for the Society does not pay assessed damages.

## MEDICAL NOTES.

THE NATIONAL HEALTH COUNCIL.—The National Health Council met in Washington last week. Brigadier-General Sawyer attended a conference for the consideration of the extension of health measures by the Government. Dr. Donald B. Armstrong, Executive Secretary of the Council, and Dr. Sawyer later conferred with President Harding. It is expected that there will be interesting developments.

THE ANNUAL MEETING OF THE HOMEOPATHIC SOCIETY.—The eighty-first annual meeting of the Massachusetts Homeopathic Medical Society was held in Boston, April 13, 1921. The papers presented were as follows: "An Interesting Case of Laryngeal Tuberculosis," with two illustrations, by George B. Rice, M.D.; "The Uterus and the Menopause," by DeWitt G. Wilcox, M.D.; "Diagnosis and Prognosis of Hemorrhage during Pregnancy," by E. P. Ruggles, M.D. Surgical operations and clinical exercises were conducted at the Massachusetts Homeopathic Hospital, and luncheon was served at the Hospital.

The business session occupied the afternoon, and the annual dinner occurred at Young's Hotel in the evening. Addresses were given by Dr. Alfred Worcester, Dr. Channing Frothingham, Dr. W. P. Bowers, and President L. H. Merlin. Dr. Worcester's theme was based on the necessity for more nurses, and during his remarks, attention was called to the work of the Commission appointed to study the question of maternity and infant welfare, emphasis being given to the value of nursing work in the prevention of mortality and morbidity in midwifery and among infants. In an interesting way, the development of pregnancy clinics and visiting nursing associations was forcefully described, and the benefits of these forms of social service explained. The explanation for the shortage of nurses seemed, to this speaker, to be in the failure to properly care for nurses on private duty work, in that the demands were too exacting, and hence physicians and older nurses advised young women not to enter the profession.

Dr. Frothingham clearly and logically argued for the better preparation of practitioners, by requiring a reasonable pre-medical course and also an interne year in hospitals equipped for teaching. He reviewed the work done by the committee on medical education in presenting bills to the legislature, argued that the injustice of allowing young people to enter medical schools which do not fit students to become qualified practitioners should be done away with, and showed that Massachusetts now endorses three low-grade medical schools, whereas the country at large has almost eliminated this type of medical schools.

Dr. Bowers gave a brief history of the Boston Medical and Surgical Journal, and announced that the Massachusetts Medical Society has bought the Journal with the intention of making it representative of New England, as well as local medical activities. To this end, the coöperation of the Massachusetts Homeopathic Medical Society is sought.

President Merlin explained that, having come from Kansas, he found that it requires time to adjust one's self to Boston habits and traditions, but that now he was so happy in his work and associations, that he was not desirous of going to heaven any more than the Sunday School child whose answer furnished the text for his remarks. He showed that the Boston University Medical School has entered upon a plan of development in harmony with the progressive and scientific spirit shown in the past.

The officers for the ensuing year are: President, Charles T. Howard, M.D.; First Vice-President, Edgar A. Fisher, M.D.; Second Vice-President, Nelson M. Wood, M.D.; Recording Secretary, Nathan H. Garrick, M.D.; Corresponding Secretary, David L. Belding, M.D.; Treasurer, Milo C. Green, M.D.; Chairman Board of Censors, George N. Lapham, M.D.

## EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold an examination in Boston, June 11 to 21, inclusive.

Subjects: Anatomy, Clinical Physiology, Physiological Chemistry, Pathology, Bacteriology, Materia Medica and Therapeutic Medicine, Surgery, Obstetrics and Gynecology, Hygiene and Sanitation. The certificate of the National Board is accepted as equivalent to a professional examination by the Federal Services and a large majority of State Medical Examining Boards.

Eligibility for examination: A four-year high school course, two years of acceptable college work, including physics, chemistry, biology and a modern foreign language; graduation from a Class A medical school, and one year as interne in an acceptable hospital or laboratory; application for examination will be considered from interne who had completed at least six months of interne service.

Applications should be made before May 25, to allow for proper investigation of credentials.

Information and application forms may be obtained from Dr. Horace D. Arnold, 520 Commonwealth Avenue, Boston. Dr. Arnold may be seen at his office from 4 to 5, Mondays, Wednesdays and Fridays, until May 25, or by appointment.

## SOCIETY NOTICES

New England Ophthalmological Society.—The next meeting of the Society will be held at the Massachusetts Charitable Eye and Ear Infirmary, 233 Charles Street, Boston, on Tuesday evening, April 26, 1921, at eight o'clock.

Hospital Cases: Cases of dacryocyst-rhinostomy. Separation of the retina treated by electrolytic punctures. Demonstration of foreign body spud illuminator. Dr. W. Holbrook Lowell, Boston.

Case Reports: "Primary Sarcoma of the Cornea, with Report of a Case." Dr. George S. Derby, Boston: "Unusual Case of Retrobulbar Neuritis." Dr. Joseph L. Dowling, Providence; "Recurring Polypoid Granulation Due to Foreign Body in Eyelid," Dr. J. H Doyle (by invitation); "Case of Embolism of the Retinal Arteries," Dr. H. B. Riemer (by invitation): "Glioma Retinae Treated by X-rays with Apparent Success. Period of Observation, Three Years," Dr. F. H. Verhoeff, Boston. W. Holbrook Lowell, *Sec*

New England Association for Physical Therapeutics.—There will be a meeting of the New England Association for Physical Therapeutics on Tuesday, April 26, 1921, at eight o'clock at the Hotel Victoria, 271 Dartmouth Street, Boston, Mass.

Dr. H. C. Westervelt of Pittsburgh, Pa., will speak on "Physiotherapy in Military and Civil Practice," illustrated.

Dinner in the grill room at 6.30 p.m.

Dr. Louis B. Hayden, *Secretary*.

Worcester District Medical Society.—The regular meeting of the Worcester District Medical Society was held in the Out-Patient Building of the Worcester City Hospital, April 13, 1921. The following papers were read: (1) "Cancer of the Appendix, with Report of a Case," Dr. C. J. Byrne; (2) Routine Treatment of Prostatism," Dr. W. B. Bieberback; (3) "Interpretation of Some Electro-cardiograms," Dr. G. M. Albee; (4) "Routine Surgical Trettment of Thyroids," Dr. R. P. Watkins; (5) "Report of Three Hundred Cases from the Standpoint of Blood Chemistry," Dr. E. B. Bigelow; (6) "Loose Bodies in the Knee-joint," Dr. F. W. George; (7) "The Hospital as a Diagnostic Centre," Dr. E. L. Hunt; (8) "Review of Some Cases of Calculi of the G. U. Tract, Illustrated by Lautern Slides," Dr. O. D. Phelps.

The course of lectures given by Dr. Frederick T. Lord of Boston, under the auspices of the Worcester Extension Course of the Harvard Extension Graduate School of Medicine, has been so extensively subscribed that three or four extra lectures will be added to those already announced. Fifty-five medical men from Worcester and vicinity are taking the course.

Dr. Charles A. Drew, Superintendent of the Worcester City Hospital, is making a satisfactory recovery from a slight fracture of the skull. While attending a dinner of the Dartmouth College Club, he was taken with an attack of vertigo, and fell, heavily striking a table. It is expected that he will be able to take up his duties in the course of two or three weeks.

The Boston Medical and Surgical Journal

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April 28, 1921

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# Worcester District Medical Society.

REGULAR MEETING, FEBRUARY 9, 1921.

## SYMPOSIUM OF DENTAL INFECTIONS AND THEIR RELATION TO DISEASE.

### I. THE VIEWPOINT OF THE ROENTGENOLOGIST. THE SIGNIFICANCE OF CERTAIN X-RAY APPEARANCES IN THE DENTAL ROENTGENOGRAM.*

BY FREDERICK W. O'BRIEN, M.D., BOSTON.

THE certain x-ray appearances in the dental roentgenogram, of which there is here question, are those interpreted to mean, pericementitis, apical abscess, pus pocket, pyorrhea and necrosis. There is no controversy concerning frank osteomyelitis of the jaw with definite bone destruction, involucrum and sequestrum formation, nor of other pathological conditions of the maxillae as the cystic odontomata which are accepted as definite entities requiring operative interference. Of course, if you specify your granuloma as a simple cyst under the generic term, cystic odontomata, then the statement just preceding must be modified, since the granuloma is the much discussed apical abscess which, along with the others in the group above, is believed to be definitely related to systemic infection.

The roentgenogram is essentially a shadow picture, a photographic image, registered by x-rays. It represents the relative values in light and dark tones of the radiability of the object in the path of the x-rays. Therefore, when in the roentgenogram you get a color value that is light in tone, it means decreased radiability. Wherever you get a color value that is dark in tone, that represents increased radiability.

The normal tooth structure and surrounding alveolar process presents the approximate appearances as seen in Figure 1. I want you to notice, with care, the apparent complete contiguity of tooth and socket. There is no color line of demarcation. Now look at Figure 2 and therein you observe a linear area of increased radiability that outlines the tooth socket. This linear marking is an actual change in color value. It is dark in tone and in a properly made x-ray negative can indicate only one thing, *viz.*, a linear area of increased radiability. It means the absorption of something. I know it is not the tooth proper, for that is present. It is not the alveolar process in this case, for that is intact. Since increased radiability signifies infection, chronic or subacute, the roentgenologist interprets this black line

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* Read at the Annual Meeting of the New England Roentgen Ray Society, Boston Medical Library, Nov. 22, 1920.

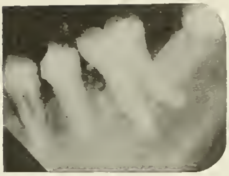

Fig. 1.

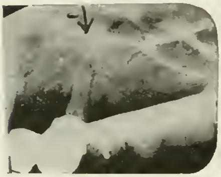

Fig. 2

actually about the cementum to the pericementitis.

Now one may not see this black line outlining the entire tooth, but find it localized about the apex of a devitalized tooth with or without an incompletely filled root canal. If in the former case, you accept its pathological basis, then it should hold here. In fact, I believe, dental experience tells us that it is the x-ray film with very little, or only questionable evidence of pathology, from the clinician's viewpoint, that most often checks up with abscess findings on extraction. Linear changes at the apex must also be considered in another light. One must be certain that the angle used in the process of roentgenography is correct, for often the slight apical change may in reality (Figure 3) be relatively great when properly represented.

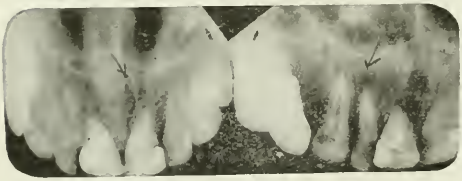

Fig. 3.

Once this dark tone about the apex of a tooth is increased in size and is definitely circumscribed, then is one upon the royal battleground, for such is the x-ray image of what is commonly, but often erroneously, called, an apical abscess. There has been a great deal of talk about whether or not x-rays can show an abscess. The meticuolus person argues an abscess means pus, and the x-rays do not show pus. I am not so certain about that. I will agree that it is not always spelled out, p-u-s, in the roentgenogram, but I do know that the competent roentgenologist will note tone changes in the roentgenogram that denote the photographic representation of pus, or the result of pus processes.

This circumscribed area of increased radiability about the apex of a tooth, represents the absence of something, *viz.*, alveolar process, and often the tooth itself. Then there has been destruction from trauma or infection with pressure necrosis. Indeed, you do not have either process without pus.

If this area of increased radiability is homogeneous in color tone, black as opposed to white, with no x-ray evidence of the anatomical structure, then one is dealing with an abscess cavity (Figure 4), whose previous contents have been absorbed, and which now is probably benign, all the more so if this area is encircled by a line of decreased radiability, light in tone, signifying a calcified, walled-off abscess cavity. It is these very abscess cavities that are called habitually abscesses, and often they are nothing of the sort.

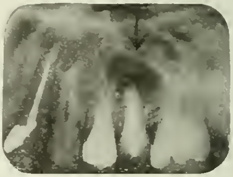

Fig. 4.

Occasionally, the roentgenologist can, without question, demonstrate what can only mean one thing, if there is anything in this interpretation of color tones, and that is a definite active focus of infection, a granuloma or pus sack, which really contains abscess products. Figure 5 pictorially demonstrates this. In Figure 6, you will note the old walled-off apical abscess

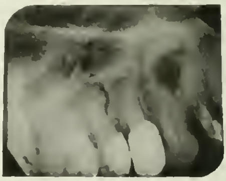

Fig. 5.

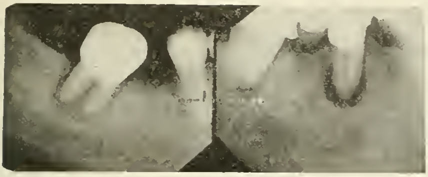

Fig. 6.

cavity, a potential source of trouble, to be sure, and the apical abscess definitely an active source of trouble here and now.

At other times, one will see about the apex of a tooth on the x-ray film, an area of increased radiability that is not delimited and within which one can make out the anatomical architecture (Figure 7). This often has been called necrosis. That is a very foreboding term. It may mean a very early change in abscess formation, or a senile atrophic condition or end process of nutritional disturbance. One should employ the term, "necrosis," with caution. There has been death, perhaps, microscopically, but I should be fearful to take upon myself the burden of reporting necrosis, if such a diagnosis were to be used as an attempt to justify a surgical procedure without very definite subjective and objective signs.

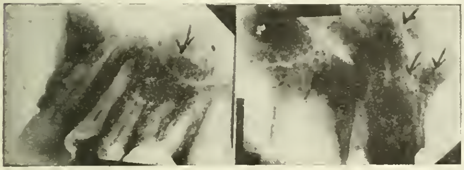

Fig. 7

There is a parallel for my treatment of these circumscribed areas of increased radiability about teeth in the roentgen ray study of the lungs. Surely, there one can demonstrate walled-off abscess cavities, frank abscesses and abscess cavities partly filled with pus, to the satisfaction of even the uninitiated.

In other cases, this circumscribed apical area of increased radiability is absent, but extending down from the gum line on one or both sides of a tooth, may be seen a triangular-shaped area of increased radiability, dark in tone, but not as intense as that seen in the apical abscess cavity, because there has not been complete destruction of the alveolar process. Such areas are described as pus pockets. (See Figure 8.)

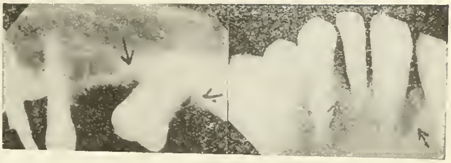

Fig. 8.

While there has not been complete destruction of the alveolar process, there has been atrophy with recession of the gum line, and some retraction of the alveolar process. This recession and atrophy, it is true, may be due to improper fillings, but one does not see the triangular area of increased radiability with the base line along the gum in pressure atrophy cases, but rather is there a retraction of the alveolar process, with little or no atrophy, and gum recession which is symmetrical. Were the roentgenologist to fail to report such appearances and their probable significance, he would be recreant to the patient, his consultant and to himself.

When the black line is present along with atrophy and retraction of the alveolar process, again indicated by areas of increased radiability, then does the x-ray negative portray the appearance of what we call pyorrhea (Figure 9).

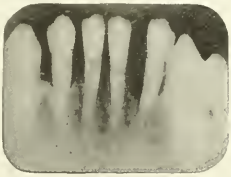

Fig. 9.

In conclusion, let me query what sort of a report should the roentgenologist render his consultant? Should it be a mere recital of the changes in radiability observed by him, *e.g.*, a circumscribed area of increased radiability about the apex of such and such a tooth, or should it go further and be a completed judgment, in other words, an opinion, circumscribed apical area of increased radiability consistent with abscess cavity of long standing, or consistent with abscess and probable active source of constitutional disease. Only by rendering a diagnosis of the latter type, I believe, can the roentgenologist justify his medical training and experience. I do not think it is within his province, however, to indicate to a dental consultant the method of treatment of the conditions found. However, he has the right and the obligation to point out what he finds, and believes to be pathological.

## II. THE VIEWPOINT OF THE DENTIST.

By Frederick A. Keyes, D.M.D., Boston.

Upon few specialties, in recent years, have the eyes of the medical profession and the laity been focussed with greater attention than on roentgenology and dentistry. This attention has been due, probably, to the increased popularity of the theory of focal infection. Unfortunately, however, at the present time, both roentgenology and dentistry are suffering from radicalism on the subject of focal infection which, though nourished in an atmosphere of ethics by high authorities in both professione, has carried with it an air of quackery.

It was to be expected that the advent of roentgenology should bring with it inadequately trained men whose sole object was to profit by mystification. Fortunately, this type is limited in number. The introduction of focal infection, I regret to say, has produced the same type of mystic in dentistry. A closer cooperation and understanding, then, between genuine roentgenologists and dentists will eliminate many of the present-day radicalists and faddists in both professions.

A graduate in dentistry is one whose special province in medicine is the care of the teeth and jaws. The activity of many of our dental and medical supply houses in selling their wares, such as x-ray outfits, blood pressure apparatus, stethoscopes, etc., to dentists, has created a type of man who is neither dentist, roentgenologist, rhinologist, nor physician. To quote from an article in a recent dental journal relative to the modern dentist and his prerogatives,[1] "His records should include blood-pressure readings, both systolic and diastolic, with the deducted pulse-pressure, blood count, with differential count and hemoglobin percentage, urinalysis, heart and chest sounds by auscultation and percussion, and the most complete bacteriological determination possible by means of stained smears from lesions, cultural growths and of a definite differential determination of the colonized organisms.

"The pulse, temperature and respiration should be charted, heart murmur and regurgitations noted, history of palpitation and dyspnoea on exercise, loss of weight, neurasthenia marked by malaise, lack of energy, insomnia, loss of appetite, and pain in the back, regional cephalalgia and clinical or submitted history of opsialgia should be charted. The condition of the eyes with reference to purulent conjunctivitis, the condition of the ear with reference to forunculal or suppurative otitis, the condition of the stomach and bowels, and every clinical evidence which might be in any measure attributed to subacute infection should be noted and charted."

It would appear, then, that instead of practising one specialty, we dentists are expected to be specialists in *all* branches. If we do not feel competent to be a one-man hospital staff, we should at least own an x-ray outfit. I say, own, and merely own, for it is surprising to see how many x-ray machines are at present established as ornaments in the offices of some of our best dentists. In fact, we have an abundant supply of dentists posing as dental roentgenologists, exodontists, oral surgeons, etc., all, or one at the same time, as the occasion demands, whose sole training in roentgenology has been the supply house catalogue. The dental roentgenologist justifies his existence by the claim of greater familiarity with the anatomy of the parts, etc. Should not a surgeon, then, make the same claim with regard to the abdominal viscera and likewise become his own x-ray man? My contention, therefore, is that x-ray work is a specialty, that this work should be sacred ground and that no other branch of medicine has any right to trespass.

Let us now consider the various methods employed by some of our professional men in diagnosing dental disease and its application to the individual patient.

First, I would like to call to your attention the abandon with which the patients are referred for x-ray pictures. Many physicians and dentists believe that teeth should be x-rayed as a matter of routine, whether there is any physical indication or not. With radiograph reports for an excuse, thousands of teeth have been extracted from normal adults on the slight suspicion that arthritis, pyelitis, etc., may or may not be present. In fact, the patient may be enjoying splendid health today; but tomorrow, what may happen? Now to my mind, it is poor logic to prophesy or prognosticate what a patient will suffer in ten or fifteen years. Furthermore, this theory is refuted daily in medical subjects with which we are more familiar than focal infection. In my opinion, patients should be referred for x-ray pictures only when there is some medical or dental problem to be solved and not for "snap-shot prognostications." More teeth have been slaughtered by medical and dental prophets, sheltered by the smoke screen of the x-ray, than have been lost by dental caries.

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* Read at the Annual Meeting of the New England Roentgen Ray Society, Boston Medical Library, Monday, Nov. 22, 1920.

In spite of the danger of promiscuous x-ray interpretation, the dentist has no greater or more valuable aid in diagnosis than the x-ray, especially in checking up his root canal work.

In the presence of constitutional disease, where there is indication of toxic absorption, the x-ray is invaluable in helping proper dental diagnosis. On the other hand, the theory of focal infection is being over-played. "It must be remembered that an apical abscess does not always indicate constitutional disease any more than constitutional diseases indicate apical abscesses."[2]

In considering the teeth as a focus of infection, it must also be remembered that they are always primary foci, therefore, other primary foci, such as tonsils, sinuses, gall-bladder, genito-urinary tract, etc., should be carefully eliminated by the internist before the teeth are blamed.

Unquestionably, we have plenty of clinical evidence to substantiate the teeth as a focus of infection. Remember that the secondary foci may persist for months and years after the removal of primary foci, which may account for the many cases which do not improve. If we were as ready to publish reports of cases which show no improvement after the removal of primary foci of infection as we are to publish startling recoveries, we should probably not be suffering from the present day radicalism of false x-ray interpretation and radical extraction.

Oral surgeons, exodontists, and the great mass of common, every-day dentists, like myself, need conservative guidance in the proper interpretation of x-ray pictures from you men who have given your lives to this specialty. For example, a positive x-ray report of a pathological condition should mean that exactly. In other words, the roentgenologist should be very careful not to report *doubtful* pathological conditions as positive. Radiographs should be made from enough angles to insure a complete report, so that the dentist may not be confronted today by a positive, and tomorrow by a negative report. In case of suspicions or doubtful pathological conditions it might be well for the roentgenologist to suggest a new radiograph at a later date, which might then insure a definite report.

It is, of course, unnecessary for me to warn you here against the old familiar misinterpretations, such as the shadow back of a second molar, caused by the coronoid process of the mandible, or that caused by the mental foramen, the anterior palatine foramen, the antrum or the vertebrae, all of which produce conditions which appear to be pathological.[3]

In making the report, the roentgenologist should remember that the omission of a word sometimes results in misinterpretation. For example, a roentgenologist reported a fracture case of mine to a physician thus:

"Mrs. X. shows perfect alignment of fracture, with no union." Now, as a matter of fact, I had removed the fracture appliance and the patient had been moving the jaw (chewing, etc.) for ten days without the slightest discomfort, showing that there *was* union (*i. e.*, fibrous union, which does not appear in the radiograph. This roentgenologist should have learned the history of the case from me and should then have reported "no *bony* union." The physician, not knowing the dental condition, immediately referred the case to another dentist to miraculously establish bony union.

The roentgenologist should also be most cautious in the use of the pathological terms, as necrosis, etc. I recently witnessed a radical antrum operation, the sole excuse for which was the wording of the x-ray report, with no clinical picture. The report of "granuloma at apex of superior left lateral, with extensive necrosis," afforded the operator an opportunity for a thorough curetting of healthy bone and an investigation of the area which carried him into a normal anerum. Right here let me say that most authorities agree that the antrum should *never* be opened intra-orally by a dentist, except under the direction of a rhinologist. Too many normal antrums have been needlessly explored because the roentgenologist has been too loose in an x-ray interpretation to a radical operator.

It so frequently happens that there is a wide discrepancy between x-ray interpretation and clinical picture that it is difficult to determine the proper course of treatment. I hope that the time is not far distant when x-ray interpretation will become stabilized and thus, indication for proper dental interference assured.

Let us now consider, from the dentist's viewpoint, pericementitis, pus pockets, pyorrhea, chronic abscess and necrosis.

1. *Pericementitis.* This condition on the radiograph varies from a pencil line to the beginning of a so-called granuloma. It often shows on teeth with live pulps and has been a much-argued point between dentist and roentgenologist. I believe that this condition in the presence of a live pulp is benign. Where the pulp is devital and evidence of root canal treatment is present, it also means nothing except, perhaps, an old infection of short duration which should ordinarily not be disturbed unless in the presence of a severe constitutional disease. But if this condition (dead pulp, etc.) is accompanied by severe constitutional disease, extraction is generally indicated.

2. *Pus Pockets.* This has been the favorite advertising field for the "specialist." The term is a misnomer. From an x-ray viewpoint, this condition should be reported (to eliminate incipient pyorrhea, food pockets, improperly approximated fillings, etc.), but to label it as a really serious focus of infection is not substantiated by experience. Seldom have I obtained pus clinically from a so-called pus pocket. In fact, it is generally recognized that this condition is found only by the x-ray. Clinically, I have never seen a pus pocket which has given evidence of pus formation (pain, heat, redness, etc.). In fact, it would be impossible for this condition to exist without these symptoms some time or other. True, the pocket may be present, but with an outlet, and this free from the above symptoms, but it would be wrong to call this draining pocket anything but incipient pyorrhea. When this condition is reported by x-ray, and clinically I find good healthy gums, I discard it entirely.

3. *Pyorrhea.* This condition by x-ray is positive and shows structural changes in the alveolus. Clinical, likewise, it is positive. The two theories concerning this disease and focal infection are, first, that the pus is absorbed through the blood and lymph, and second, that most of the pus is swallowed and assimilated by the gastric juice, and that damage may or may not result. In the presence of constitutional disease, where the clinical picture is positive, I feel justified in removing, by generally accepted dental standards, every tooth involved. The x-ray interpretation of pyorrhea, however, is so varied that it should usually be disregarded; for example, cases of so-called dry pyorrhea show very clearly in the x-ray, but clinically we find gums only slightly receded, no pus, and teeth firmly fixed. Even though the x-ray shows bone change in this condition, extraction is not indicated. Pyorrhea presents so true a clinical picture that the x-ray seldom aids either diagnosis or treatment. In cases of incipient pyorrhea, the x-ray may warn us of the need of careful clinical observations.

Alveotectomy and alveotomy, which are the latest cures for pyorrhea, are, to my mind, radical surgery, indicated neither radiographically nor clinically. A short time ago, I witnessed an alveotomy on a patient over 60 years old, under chloroform anesthesia for one hour. The operation consisted in burring necrotic bone which appeared only in the x-ray and the vivid imagination of the operator.

4. *Chronic Abscess.* This condition is a much debated one. When does a pericementitis cease, and a granuloma begin? Is the alveolar abscess walled off, an old process, or is it a definite active process? Is there a dead pulp present? Are the root canals imperfectly filled? Are there large fillings down in pulp chamber, with no evidence of pulp treatment? Is there constitutional disease present? In the presence of constitutional disease, I feel justified in extracting a tooth with a granuloma, except when the clinical picture indicates a live pulp. If there is no constitutional disease, dental treatment of the root canal is my procedure. Dr. O'Brien's differentiation between a chronic abscess and an abscess cavity is very timely. Whether or not abscess cavities are as benign as one group of men would lead us to expect, or as malignant as the radicals claim, is still undecided, but if a patient is referred to me by an internist with constitutional disease becoming progressively worse, I feel justified in extracting any tooth with a dead pulp, provided other primary foci of infection have been thoroughly eliminated. But in a patient of normal health, with no indication of constitutional disease, these roots should all be

treated, and the teeth saved, if clinically possible. It must be remembered that oftentimes, improperly filled root canals, with putrescent pulp, etc., with no x-ray evidence or clinical picture, there may be more pathology present than in a granuloma. Granuloma is often miscalled necrosis, and has been the cause of great confusion.

5. *Necrosis.* This term has been improperly used to define every shadow condition around the teeth. The clinical picture is almost always negative. The patient has pink, hard, healthy gums, no fistulae discharging pus, no evidence whatsoever, of real classical necrosis. Until we obtain some more definite information as to the real pathology of this so-called necrosis (thinning of bone), and until the clinical picture is optically positive, I never feel justified in opening into the jaw bone on the sole evidence of the radiograph. Many times, I have seen surgery done in these cases and have never witnessed necrotic tissue, sequestrum, pus, or, in fact, any of the expected sequellae of necrosis. In fact, healthy bone has been curetted and by some mysterious system of clairvoyance, the operator informs you he is removing "infected material." Indication of bone destruction, such as sound, touch, sight, and smell, are absent. But still, does not the x-ray show necrosis? We know that there is x-ray evidence of some change in the bone. But what this change is, is still a question. To call it necrosis opens an avenue for radical surgery, and is not substantiated by clinical findings. True necrosis, with sequestrum, pus, etc., show radiographically and clinically, asd surgery is plainly indicated.

### CONCLUSION.

This is a brief survey of the five pathological dental conditions which were chosen for discussion this evening. There are many other conditions, such as misinterpretation of unerupted teeth as impactions, exostosis of roots giving no trouble as pathological, harmless pulp stones, etc. The one point that I hope my paper has demonstrated is that the x-ray picture is of invaluable assistance in dental diagnosis, but the clinical picture is still the important guide for treatment, and that the genuine roentgenologist and dentist should have more frequent consultation, and the few, but noisy radicals in our respective professions should be made to "walk the plank."

### REFERENCES.

[1] Lucas, Carl: Dental Summary, November, 1920.
[2] Howe, P. E.: Lectures.
[3] Miner, L. S.: Dental Cosmos, March, 1919.

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## III. THE VIEWPOINT OF THE BACTERIOLOGIST.

By Percy Howe, D.M.D., Boston.

The x-ray is used principally in dentistry in the search for what are called foci of infection. These foci, we are told, are points of entrance for certain bacteria into the system. From these points they are said to be conveyed by the blood and lymph streams to different parts of the body, where they are supposed to inaugurate disease. All the different effects of light and dark, as shown by the x-ray, are interpreted in terms of infection. All other pathological factors are ignored.

The principal infective agent that is regarded as the cause of diseases that are supposed to arise from areas about the teeth, is the short-chain, non-hemolytic streptococcus, called viridans. It is constantly reported that S. viridans is found in *pure culture* in these areas. The purity of these cultures may reasonably be questioned. Moreover, as Krumwiede says, "the term, 'Streptococcus viridans' is simply a term that applies freely to a large group of cocci, a group which is extremely heterogeneous in character. Streptococcos viridans is not a distinct type like the typhoid bacillus, all of which are alike." Also the type of bacterial life brought out by culture from areas of this kind about the teeth, depends on the media used and the method of cultivation. One kind of media may bring out streptococci, and another kind bring out an entirely different class of microörganisms. Neither necessarily approximate the nature of the conditions as they exist in the living body. At all events, the flora about the teeth is very varied. So far as the S. viridans is concerned, it is to be remembered that it is a normal inhabitant of the mouth. It is found in all healthy mouths, from infancy to old age. It is suppressed only during disease. It reappears with recovery. If it is the cause of dental troubles, all that is required is to inject it into the tissues about the teeth, when it should regularly produce the disease. When this is done, nothing but spontaneous healing occurs. Many have tried this, but no one has succeeded in establishing a dental abscess, nor any condition that remotely simulates pyorrhea. How, then, can it be considered the cause of these troubles? In pyorrhea, a great variety of micro-organisms is found. The injection of any group or mixture of them is followed by spontaneous healing. No disease is established. Noguchi, in his study of the spirochetes of pyorrhea, says that they will not grow on healthy tissue. The ground for growth must be previously *prepared*. The cause of pyorrhea, is, he states, an anomalous metabolic condition. Kinsella says of the S. viridans that when constantly found in the blood stream and upon a *previously injured* heart valve, its growth seems purely saprophytic. On the other hand, it is possible to produce with regularity, a condition in animals that is very similar to pyorrhea, by feeding them a faulty diet. The infection is not then the governing factor in pyorrhea, but it is the tissue condition that governs the infection. This type of infection grows in areas of lowered resistance. It is a secondary factor in ordinary diseases about the teeth. Streptococci of this variety have, at one time or another, been thought to be the cause of many diseases, such as smallpox, whooping cough, scarlet fever, poliomyelitis,—only to be proved secondary invaders. The resistance of a part being lowered, the localization of the bacteria follows. They do not, then, without any reason, whatever, proceed in some cases from the teeth to the brain, causing insanity, and in other cases, from the teeth to the feet, causing fallen arches. If they are found in either of these parts, it is because the ground has been *previously prepared* for their growth. Not all areas revealed by the x-ray need be regarded as death-dealing centers: and wholesale extraction based upon this idea should be stopped.

One of the valuable things shown by the x-ray is the location of impacted teeth. These teeth often produce a marked nervous and vascular disturbance. This is of mechanical origin. Relief follows the removal of the tooth.

Abscesses about the teeth are no different from any other small abscess. With pus formation, the staphylococcus is usually present. These abscesses may be cured as readily as any abscess.

What has been called a granuloma may be an exceedingly small abscess undergoing repair or merely a thickened condition of the peridentium. It is a walled-off, circumscribed affair, attached to the root-end. The alveolar bone in which it lies is often hard and polished. It frequently undergoes fatty degeneration and calcifies. The granulomas shown in textbooks are usually in an acute state. It is difficult to find bacteria in granulomas after sectioning and staining them. Occasionally, bacteria may be found, usually not. The bacteria seen in illustrations are usually brought out by culturing the tissue for several hours before sectioning. This, of course, does not represent conditions as they actually exist. The granuloma may be treated in many ways, and a closer filling of the bone about the tooth will occur. The removal of the tooth is not necessary.

In gouty patients, a thickening of the peridental tissues occurs, followed by an extensive calcification. This appearance, as seen in the roentgenogram, does not demand the extraction of the tooth. If the tooth is firm and of use, it should no more be removed than a gouty joint. This represents a local indication of a general calcium disturbance.

Many areas that have appeared in the roentgenogram have been found to be non-existent when cut down upon. Sir Kenneth Goadby gave many illustrations of this at his lecture in Boston. Considerable familiarity with dental pathological conditions and the possibilities of cure is necessary, before we condemn teeth too readily from x-ray evidence.

One of the most instructive things that the x-ray shows, is the bone-regeneration that follows treatment of these pathological areas. This requires time. Consequently, account should be taken of the time elapsed since treatment, before deciding that an abscess exists.

Often, small areas are seen about root-ends that are indicative of bone recession, due to slightly abnormal articulation of the teeth. Such areas are not necessarily infected.

The extensive use of x-ray machines by dentists means that much of this work is done by amateurs. This needs to be considered in the interpretation of x-ray findings.

## IV. THE VIEWPOINT OF THE ORAL SURGEON.

By Kurt H. Thoma, D.M.D., Boston.,

*Assistant Professor of Oral Anatomy and Pathology, Harvard University Dental School.*

The roentgen examination is one of the greatest aids in making a diagnosis of dental and oral surgical conditions. It is important, however, not to overlook the clinical side, and I am opposed to the view held by one of the previous speakers that roentgen films should be made only by men whose practice is limited to roentgenology. It is true that many practitioners of general dentistry have not sufficient experience to interpret roentgenograms properly, but it is obvious that the dentist who practices roentgenology in connection with oral surgery, is equipped to give the best service, not only to the patient's physician or family dentist, but also to the patient himself. An examination of the medical roentgenologist is usually satisfactory if he has developed a careful technique, to give general information regarding impacted teeth or infection, but the finer details and recommendations as to methods of treatment can best be given by the roentgenologist who has made dental anatomy and pathology his special study, and by the oral surgeon, who has opportunities for comparing his diagnosis with the clinical findings of the operation.

Variations of the appearance of so-called abscess cavities in roentgen films have, to my mind, more to do with their anatomical location than with their pathological content. The defect in the bone consists, as is evidenced by examination of skulls,[1] of a cavity caused by bone destruction, with osteoporosis of the surrounding bone. The loss of bone is what is registered in a roentgen film. The size of a dark area around a tooth apex, therefore, depends on the size of the abscess cavity. The difference in shade and texture of its picture depends upon its location. If the outer or inner cortical plate of the bone has become perforated, we get a deeper shadow than from a cavity in the cancellous bone between the two thick, unaffected cortical plates of the mandible. Again, if the apex of the root is close to the surface, as is often the case with upper incisors, we may find only a shallow depression in the surface of the bone. This would give a very indistinct picture, and the structure of the underlying, cancellous part of the bone could probably be distinctly seen in the area on the film. In the upper bicuspid and molar region, it is important to keep in mind that often there is only a thin layer of bone covering the tooth apices, especially if the latter protrude into the maxillary sinus. The bone is not sufficiently thick for an abscess cavity to be formed and, therefore, we usually get very little roentgen evidence of the infection. One kind of picture which is always typical is that of an incipient cyst. The dark area is surrounded by a distinct light line, representing cortical bone lining the cavity. Such cysts are developed from apical abscesses containing epithelium. When the lesion becomes larger, the roentgen picture gives exactly the same appearance, except for the difference in size.[2]

Acute and chronic conditions cannot be differentiated roentgenographically. It makes no difference whether the cavity in the bone is actually filled with pus or with inflammatory granulation tissue, as in a blind abscess, or granuloma. In an acute abscess, with the most violent symptoms, we sometimes get a decided picture showing an extensive area of bone destruction, while in other cases there is no roentgen evidence, on account of the fact that no extensive bone destruction has occurred, the pus having burrowed a small channel to the surface, accumulating under the periosteum and in the gum.

One of the most important features to diagnose in these cases of dental abscesses is the condition of the apex of the root. The tooth tissue, when surrounded for a long time by the abscess, becomes pus-soaked and forms an obnoxious foreign body, which can be best compared with a bone sequestrum. Microscopic examination shows that the small lateral apical foramina are filled with bacteria, and that absorption takes place,[3] which can be recognized in a good roentgen picture. Evidence of such absorption indicates surgical treatment, either extraction or resection of the diseased part of the tooth, after careful sterilization of the rest of the root. This operation, however, is only indicated in selected cases in the anterior part of the mouth.

The writer believes that all teeth which give roentgen evidence of bone involvement are infected and, while the infection is generally latent, giving no symptoms, this does not mean that it is a negligible condition. There is a slow, but continuous formation of pus, and the only reason that the infection does not more frequently become evident clinically is because of the wonderful blood supply of the jaws and the prompt formation of a protective barrier. If, however, an additional burden is placed on the defensive system of the body, as, for example, in sickness or pregnancy, we quite frequently find that the chronic lesions become active and acute. The result of local influences also bears out the same fact. A tooth with roentgen evidence of infection, which has given no symptoms for years, very often starts an active process when opened up, admitting oxygen, and the writer has observed three cases of blind abscesses, which probably had existed for years without the patient's knowledge, and which became suddenly acute from roentgen exposure during routine examination of the teeth. If used therapeutically this exposure would be considered a stimulating dose of roentgen rays. This all goes to prove that these conditions, giving no clinical evidence and recognizable only by roentgen examination, are unquestionably infections of latent character and important harbors of bacterial proliferation.

The relation of these conditions to systemic diseases is, of course, not in the scope of this short paper. I believe that dental conditions are very often the primary or contributary factors in diseases of the nose and throat and ears. Disregard of dental conditions in the treatments of infections of the maxillary sinuses is, no doubt, often a cause of poor results. Judgment is necessary, unbiased by radicalism and based upon careful clinical and roentgen examination of the jaws.

While it may be necessary, for purposes of local hygiene, for dental infections to be eradicated, the dentist should not make promises to the patient regarding systemic disease, of which he usually understands little. This should be left to the internist, who will also consider possible foci in other parts of the body and make a careful study of the general disease to decide what should be done for the patient. No doubt, removal of the original cause of a transported infection, though very important, is more a preventative than a curative measure, especially if the disease has become well established.

REFERENCES.

[1] Thoma, K. H.: Dental Diseases in Relation to Diseases of the Nose and Throat, Fig. 6. Boston Medical and Surgical Journal, Vol. clxxix, No. 1, pp. 17 to 20, July 4, 1918.

[2] Thoma, K. H.: Oral Roentgenology. Boston, Mass., M. C. Cherry, page 139.

[3] See Reference 1, Figs. 3 and 4.

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The Massachusetts Associations of Boards of Health will make the next meeting on April 28, 1921, a tribute to the life and work of Professor William T. Sedgwick, who has given unsparingly of his time and interest in making this association a power in public health work. Addresses will be given by Dr. E. R. Kelley, Professor George C. Whipple and President A. Lawrence Lowell.

## Original Articles.

# THE ENERGY CONTENT OF EXTRA FOODS. (SANDWICHES.)

(Third Paper.)

By Cornelia Golay Benedict, Boston,
and
F. G. Benedict, Boston.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.]

The ready-prepared sandwich, consisting usually of two pieces of bread, with or without butter, with a filling either of meat, fish, salad, marmalade, jelly, or cheese, has become an important gastronomic American institution. Restaurants and drug stores, particularly, are meeting this demand by having these sandwiches already prepared in large variety. While sandwiches are, in many cases, to be sure, eaten as the regular noon lunch, the fact that they are usually conveniently wrapped in paper makes them especially useful for picnics and for automobile lunches, and consequently they are often eaten between the regular meals. The energy content of these sandwiches, because of their complex nature, is not readily computed from previously existing data, although it is obvious that a not inconsiderable amount of the energy must come from bread. We purchased, therefore, a large variety of sandwiches, subjected them to desiccation, and subsequently determined their heats of combustion in a bomb calorimiter.* All details with regard to the dealer, variety, price, weight and total calories, together with general comments, are given in the table herewith, in which the sandwiches are roughly classed as meat, cheese, salad, and miscellaneous.

It appeared evident at the start that there was a distinct tendency on the part of certain stores, particularly the so-called "chain" stores, to standardize more or less the sandwiches served over their several counters. As a partial check upon this, in three instances we purchased the same kind of sandwich in two different stores, but under the same central management. These instances may be noted from the first column in the table, where the dealers of stores under the same management are designated by the letters A, B, C, etc. With the rapidly shifting prices of the present day, it is

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* We wish to express our appreciation here, as in our second paper, of the painstaking assistance of Miss Mary D. Finn, whose skill and accuracy have made the accumulation of this material in large part possible.

## SANDWICHES.

| Dealer | Variety | Price | Weight of |  |  | Estimated calories in bread | Total calories in sand-wich | Remarks |
|---|---|---|---|---|---|---|---|---|
|  |  |  | Bread | Meat | Total sand-wich |  |  |  |
|  | Meat | cents | gms. | gms. | gms. |  |  |  |
| A | Corned beef | 10 | -- | -- | 73 | --- | 201 | Thinly buttered. |
| A | Do. | 10 | 41 | 19 | 60 | 106 | 166 | Do. |
| B | Tongue | 25 | 54 | 29 | 83 | 141 | 259 | One slice buttered. |
| A | Sliced ham | 10 | 48 | 20 | 68 | 126 | 192 | Thinly buttered. |
| A | Do. | 10 | -- | -- | 65 | --- | 192 | Both slices slightly buttered; ham covers whole slice. |
| C | Do. | 20 | -- | -- | 83 | --- | 267 | One slice buttered. |
| D | Do. | 10 | -- | -- | 59 | --- | 185 | Butter on one slice; ham not liberal. |
| B | Do. | 25 | 52 | 18 | 70 | 134 | 232 | One slice buttered. |
| E | Chopped ham | 10 | -- | -- | 56 | --- | 184 |  |
| D | Chopped ham and egg | 10 | -- | -- | 79 | --- | 253 | Mayonnaise; no butter; lettuce. |
| F | Frankfurt sausage | 10 | 44 | 44 | 88 | 114 | 252 | Round roll; one sausage; no butter. |
| G | Do. | 10 | 53 | 43 | 96 | 138 | 255 | Two slices bread; one sausage; no butter; mustard. |
| H | Do. | 5 | 47 | 33 | 80 | 122 | 239 | Roll; a little butter; mustard. |
| C | Sliced chicken | 30 | -- | -- | 77 | --- | 203 | One slice buttered; breast of chicken. |
| D | Do. | 25 | -- | -- | 79 | --- | 239 | Butter. |
| D | Do. | 25 | 54 | 18 | 72 | 141 | 213 | One slice thinly buttered. |
| B | Do. | 35 | 50 | 19 | 69 | 131 | 207 | One slice buttered. |
| I | Do. | 25 | 70 | 22 | 92 | 183 | 286 | One slice buttered generously. |
| C | Crabmeat | 25 | -- | -- | 91 | --- | 221 | Mayonnaise; lettuce. |
| D | Imported sardine | 15 | -- | -- | 82 | --- | 248 | 7 sardines; lettuce; no butter. |
| C | Sardine and pimento | 15 | -- | -- | 100 | --- | 221 | Mayonnaise; lettuce; pimento; little butter; 3 sardines. |
|  | Cheese |  |  |  |  |  |  |  |
| A | Olive and cheese | 15 | -- | -- | 80 | --- | 190 | Thinly buttered; piece of lettuce. |
| D | Olive and cream cheese | 10 | -- | -- | 62 | --- | 172 | Lettuce; not very liberal filling. |
| E | Cream cheese | 10 | -- | -- | 55 | --- | 141 |  |
| J | Do. | 15 | -- | -- | 63 | --- | 201 |  |
| D | Pimento | 10 | -- | -- | 54 | --- | 153 | Lettuce; cheese on one slice; no butter apparent. |
| A | Young America | 10 | -- | -- | 61 | --- | 193 | No butter. |
| D | American | 10 | -- | -- | 57 | --- | 200 | No butter; thin slice cheese. |
|  | Salad |  |  |  |  |  |  |  |
| A | Egg | 15 | -- | -- | 84 | --- | 191 | Lettuce; chopped egg; little butter or mayonnaise. |
| D | Egg | 10 | -- | -- | 72 | --- | 201 | Mayonnaise; lettuce. |
| D | Lettuce | 10 | -- | -- | 91 | --- | 322 | Liberal mayonnaise; very little butter. |
| D | Shrimp | 20 | -- | -- | 125 | --- | 379 | Lettuce; little butter; liberal mayonnaise; about 8 shrimp |
| D | Chicken | 25 | -- | -- | 138 | --- | 485 | Mayonnaise; egg; pieces chicken; lettuce. |
| D | Salmon | 15 | -- | -- | 74 | --- | 214 | Lettuce; mayonnaise; no butter. |
|  | Miscellaneous |  |  |  |  |  |  |  |
| C | Peanut butter | 10 | -- | -- | 60 | --- | 216 | One slice buttered; peanut butter not liberal. |
| D | Orange marmalade | 10 | -- | -- | 78 | --- | 240 | Very little butter; fair amount marmalade. |
| C | Raspberry jam | 10 | -- | -- | 67 | --- | 189 | No butter; not much jam. |
| J | Nut-bread | 20 | -- | -- | 90 | --- | 306 | Little butter. |

almost impossible to make a stable financial analysis of the economic value of these sandwiches expressed in monentary units, but the price at the time of purchasing (all were purchased within a period of 2½ months, *i.e.*, between January 22 and April 9, 1920, and consequently the relative price was probably the same throughout the entire period) is given and the subsequent economic computations are based upon the actual price as recorded. It is obvious that at the present date these prices may not obtain and probably the same materials could be secured only at a higher price, with the possible alternative of a stable price but a change in the size and contents of the several sandwiches. As can be seen from the price column in the table, the sandwiches ranged in price usually from 10 to 25 cents. Only occasionally were higher prices charged, and in one instance a Frankfurt sandwich was obtained for five cents.

Each sandwich was carefully weighed and its dimensions in millimeters recorded. Since there is a general uniformity in size, it seems unnecessary to give every individual measurement. Usually they were from about 97 to 100 millimeters square, *i.e.*, about four inches square, and about 25 millimeters, or one inch, thick. After the investigation was under way, it seemed desirable to attempt to secure some information with regard to the actual weight of bread and the weight of filling in the sandwiches. Hence for the meat sandwiches these data were obtained.

Perhaps the most popular sandwich is that filled with ham, closely followed in other seasons and other years by the tongue sandwich. On account of the condition of the meat market at the time of our investigation, it was practically impossible to obtain tongue, and only one sample of tongue sandwich could be purchased Perhaps owing to the general affluence of the American public, there was a very heavy sale of the high priced slicel-chicken sandwiches. Simultaneously there was a development of the more complicated sandwiches, such as the salad sandwiches, and an increasing use of peanut butter, marmalade, and jelly as fillings.

The main object of the inquiry was to determine the total calories in the various types of sandwiches. With meat sandwiches, obviously, the total calories would vary considerably with the amount of fat in the meat and the amount of butter, if any was used, on the bread. Accordingly an attempt has been made (see column of remarks in the table) to give some rough indication of the amount of butter used. The meat sandwiches weighed from 59 to 100 grams, averaging not far from 75 grams, and the total calories ranged from 166 to 286, averaging not far from 225 calories. Special attention should be given to the Frankfurt sandwiches, which yielded approximately 250 calories and with a reasonable degree of uniformity. Referring to those instances when the same kind of sandwich was purchased of the same dealer on different days or from different stores under the same management, we find very closely agreeing results for the total calories in the two sliced ham sandwiches from dealer A, indicating reasonable uniformity in the standard composition; but with the two corned beef sandwiches purchased of dealer A and the two sliced-chicken sandwiches purchased of dealer D wide differences are noted. As stated before, however, it is possible that this may have been due to the proportion of fat in the meat.

The cheese sandwiches average somewhat less in weight and likewise somewhat less in calories than the meat sandwiches, containing not far from 170 to 180 calories. The variations in the total calories are so great, however, as to make an average figure only approximate. Roughly speaking, the number of calories is not far from proportional to the total weight of the sandwich, and when one considers that the larger proportion of the weight of a sandwich is bread, this is only what is to be expected.

The salad sandwiches present a special case. In the first place, they are practically all heavier than the average, the heaviest purchased being a chicken-salad sandwich weighing 138 grams, which likewise had the highest caloric content, *i.e.*, 485 calories. This is in large part due to the fact that there is usually a varying amount of fat-containing mayonnaise present, with, at times, butter. With the salad sandwiches, as with the cheese sandwiches, there is a tendency for the larger weight sandwiches to have the larger number of calories, although the presence of the mayonnaise is a factor that prevents making a direct proportion between weight and total calories.

Those sandwiches classified as miscellaneous weighed not far from 70 grams and contained from 189 to 306 calories, the latter value being found with the nut-bread sandwich and unquestionably explained by the high heat of combustion of nuts.

Bearing in mind, in our discussion of the economic relations of these sandwiches to the calories they contain, that the prices obtaining at the time of purchase are subject to considerable variations, owing to the shifting scale of prices prevailing in America in the last few months, we can still see that in general, aside from the sliced-chicken sandwiches, the higher the price of the sandwich the larger the number of calories. With the sliced-chicken sandwiches, it is clear that the price is altogether disproportionate to the caloric content. The salad sandwiches containing mayonnaise are, for the most part, of a fairly high caloric content, but the data for the three specimens of frankfurt sandwich show that economically these provide the largest number of calories for the money expended of any, save one specimen of chopped ham and egg and one of lettuce salad. In connection with the Frankfurt sandwiches, it is of interest to note that almost exactly the same number of calories was furnished by one dealer for five cents that was supplied by two other dealers at twice that price.

The extent to which the American public is willing to go to pay for delicacy of flavor may well be illustrated by a more extended analysis of the data with regarn to the sliced-chicken sandwiches. In three instances we weighed the meat separate from the bread. In one case we found that the total weight of sandwich was 69 grams, the weight of bread 50 grams, and the weight of meat 19 grams; in the second case the total weight was 92 grams, the weight of bread 70 grams, and that of meat 22 grams; in the third case, the total weight was 72 grams, the weight of bread 54 grams, and that of meat 18 grams. A sandwich, therefore, costing in the case of one specimen 35 cents, contained, roughly speaking, 50 grams of bread and 19 grams of sliced chicken, and yielded 207 calories. Computing the calories from bread by multiplying the weight of bread by the average value of 2.6 calories per gram of bread, we find that the bread alone yielded 131 calories while the chicken supplied 76 calories. At the time these purchases were made, first quality bread was selling in the market for 12 cents per pound, from which one can compute that the actual cost of bread in this sandwich was less than two cents. Consequently, disregarding the cost of labor and the convenient but often illusive "overhead" charge, for 19 grams of chicken meat the purchaser paid about 33 cents, or at the rate of about $7.70 per pound. Even with the other two sliced-chicken sandwiches, costing but 25 cents apiece, the estimated price paid for the meat is not far from the rate of $5.00 per pound.

It is not, however, primarily in the economic side of the question that physicians are interested, but in the total caloric intake obtained by patients who eat sandwiches of this character, especially outside of the regular meals and under conditions which would not ordinarily be reported or seriously considered in the day's diet. It can be seen that the woman going to a tea shop and taking a cup of tea with a chicken-salad sandwich may easily obtain 485 calories in the sandwich itself, to say nothing of the calories obtained in the tea, sugar and accessories. The average lunch-counter sandwich of corned beef, tongue, ham, chicken, or cheese, yields not far from 200 calories, while the popular Frankfurt sandwich yields 250 calories. These amounts are by no means negligible. One can easily see that, on the one hand, a chicken-salad sandwich may legitimately be considered as constituting a fairly substantial lunch, while, on the other hand, if taken as an extra food, it is by no means without significance, particularly in cases of obesity. In general, the sandwich, aside from the Frankfurt sandwich, cannot be stated to be a particularly economic source of energy. A Frankfurt sandwich at five cents, however, is an economical source of energy at present prices. A sliced chicken sandwich at 25 cents or above can only be regarded as a concession to the demands of the palate and is not to be considered as an economic source of energy. The bread could much better be obtained by purchasing it separately at a few cents per pound, and sliced chicken, even of the first quality commonly used in chicken sandwiches, could hardly be offered for sale for as much as $5.00 to $7.00 a pound.

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# STEM-LENGTH AND TRUNK-LENGTH.

By H. Gray, M.D., Boston,
and
H. F. Root, M.D., Boston.

*Reason for Considering Stem-length.* Recently there have reached this country two foreign books by Von Pirquet and by Dreyer, which propose methods which may prove superior to

Bornhardt's rule for judging the normality of a person's body-weight. As neither of these authors mentions Bornhardt's method, much less makes comparative tests of it and his own formula, the following critical review is submitted, to be followed shortly by some observations and tests.

*Literature on Stem-length and Analogous Terms.* This conception of "body length" appeared at least a century ago when Cuvier, 1800, took the length in a straight line from the vertex (or snout in animals) to the anus.

Quetelet, 1871, recorded the measurement from the vertex to the "bifurcation (crotch?). Presumably, this corresponds more nearly to Cuvier's measurement than to any other, and is therefore intermediate in size between the measurement to the coccyx and the measurement to the ischial tuberosities (stem-length), with the sitting height the longest of the four.

A different measurement, nearly, but not the same, from the vertex to the first coccygeal vertebra, was considered by Quetelet, 1871, ("to the bottom of the vertebral column"), Tarenetzky 1881, Henning 1881 (though he preferred the measurement, 7th cervical to the buttock), Kretschmann 1890 (it is no tclear in his case and in the case of some others here cited, whether the landmark was the first coccygeal vertebra or the tip), Rollsenn 1890, Dreike 1895 (who called the measurement to the first coccygeal "Stammlänge I," and the measurement to tip of coccyx "Stammlänge II." It must be noted that neither of these is quite the same as the more recent "stem-length," which will be more extensively discussed below), and Terner 1919. For embryos, His 1904, recommended the use of the Scheitelsteisslänge (SS1), *i.e.*, from vertex to tip of coccyx.

The "sitting-height" was another measurement recorded by Quetelet 1871, (*vertex au pli qui forme la ligne de demarcation du haut de la cuisse sur la partie posterieure du corps*); this is probably nearly equivalent to the sitting height, for, according to Piersol 1908, "the fold of the nates or gluteofemoral crease . . . . begins just below the level of the tuberosity of the ischium); and the level is supported by the fine illustration of Geyer 1902. The sitting-height (Sitzhöhe, or Si, for short) was also used by Peckham 1881 (who used the term, body height), Henning 1881, Toldt 1887 (vertex-breech in embryos), Sargent 1887, Bertillon 1889, Porter 1893, West 1893 and 1894, Smedley 1900, Manouvrier 1902, Hastings 1902, Reuter 1902, Godin 1903 (who used both the terms sitting-height and "buste"), Boas and Wissler 1904, Ranke 1905 (who used the term, Sitzhöhe, but defined it as *Tubera ischiadica bis Scheitel*, *i.e.*, a measurement apparently identical with what was later termed stem-length), Godin 1910, Mall 1910 and 1918 (who preferred the name, crown-rump length, to vertex-breech and to sitting-height), Schuster 1911, Weissenberg 1911, Friedenthal 1914, Pfaundler 1916, Von Pirquet 1917, Holmes 1918, Keith 1918, Farabee 1918 (who also calculated an index resulting from division of the sitting-height by the stature, which we will abbreviate as Si/H, and which may well be useful later in utilizing the figures reported by others); by Hrdlicka 1919 (who, similarly, calculated the percentage of sitting height to total height), by Duckworth 1919, Schick 1919, Bardeen 1920, Streeter 1920, and by Boothby and Sandiford 1920.

The "trunk-length," for body-length, was defined by Meckel, 1828, as the bony skeleton without the appendages, *i.e.*, minus, not only the legs, but minus the head and neck, thus yielding the "central portion" of the body. The same definition has been given by such other noted anatomists as Sappey 1875, Henning 1881, Godin 1903, and Dwight and Piersol 1908 and 1919, though, from the latter's words, it is not quite clear but that "trunk" may be meant to include the neck vertebrae, but not the skull, *i.e.*, to correspond to the sitting height. Henning thought, indeed, that it would be better to omit the head and neck, because these vary so extraordinarily, especially in birds, and in all vertebartes measure from the 7th cervical to the Sitzhöcker (buttock). In the light of these, the recent use of "trunk-length" by Dreyer 1920, as synonymous with "stem-length," seems ill advised.

For measuring the trunk length, the upper limit has been quite generally given as the seventh cervical spine. Note the important statement of Dwight 1908, that, "the name vertebra prominens conferred on the seventh cervical is misleading, for the spine of the first thoracic is most prominent in that region." The lower landmark, on the other hand, has, unfortunately, not been always stated.

From the seventh cervical to the perineum was taken by Gould 1869, and Crampe 1872. From the seventh cervical to the "buttock" was preferred by Henning 1881 (though, as already mentioned, he also measured from the vertex to the perineum). Still another measurement, the "kleine (or partielle) Rompflänge," or distance from the seventh cervical to the first coccygeal (and this, or possibly to the last coccygeal, seems the best interpretation for trunk-length, not including the head, as Dreyer does, in using the term synonymously with stem-length) seems to have been meant by Zeusing 1858, Aeby 1879, Lesshaft 1880, Topinard 1885, Blagowidoff 1886, Samson 1890, Rolssenn 1890, Tichonoff 1894, Starkoff 1897, Bondyreff 1902, Ernst 1906, Weissenberg 1911, Gundobin and Debele 1912, Friedenthal 1914, and Pfaundler 1916. Another definition of "trunk-length," from the seventh cervical to the ischial tuberosities, was described as Rumpflänge by Ranke 1905, and has been recently studied by Lawrason Brown (unpublished), with the finding that this measurement comprises 70-72% of the stem-length.

A longer variety of trunk measurement was that proposed by Ravenel 1877: atlas to upper part of sacrum. Much the same distance was used by His 1882 and 1904, who measured in embryos what he called the Nackenlinie, the distance foramen magnum to rump. What seems to have been the same distance was called, by Geyer 1902, miscellaneously, the Rumpf, Stamm, Truncus, Torso, and "neck-breech," by Mall 1910. Similarly, Godin 1910, measured the spine (rachis) from tip of coccyx to occipital foramen (the surface landmark of which he regarded as the auditory meatus).

The corresponding anterior measurements of the trunk were made by Quetelet 1871, from top of sternum to "bifurcation," under the title "torse" (torso), but this seems of little use, because so widely varied by depth of respiration, and in fact has received little attention, except by Godin 1903 and 1910, who again made a slightly different measurement, from the incisura sternalis (sternion) to the os pubis (symphysion); and by Schwerz 1910, Friedenthal 1914 (Vordere Rumpflänge). Incidentally, the symphysis pubis seems a more definite surface landmark than the bifurcation, since, in the words of Piersol 1908, "the tip of the coccyx should be at about the level of the top of the symphysis; owing to the many variations of the former, however, its position must be uncertain." And, in fact, Geyer's beautiful diagrams show the tip of the coccyx at the level of the *bottom* of the symphysis. This measurement may be derived by calculating the difference between Quetelet's figures for total height and height of top of pubic bone from the ground.

The length acromion to seat, called Rumpfhöhe im Sitzen, Schulterhöhe im Sitzen, was used by Reuter 1902, and similarly Bardeen 1920, defined the trunk length as: sitting height less distance vertex to acromion.

Oeder 1909, measured what he called "proportional-length," *i.e.*, twice the distance from the vertex to the middle of the symphysis, a distance, probably, most nearly comparable to the dorsal measurement from vertex to tip of coccyx (coccygion).

### STEM-LENGTH IN DETAIL.

*According to Walker.* Without mentioning the "Stammlänge" of Dreike, 1895, and others, above cited, meaning vertex to first coccygeal vertebra, Walker, 1916, proposed the measurement from vertex to ischial tuberosities, and called this the "stem-length." His definition of the stem seems easier to measure and therefore worth quoting, on grounds both of priority and of concise clearness:

"By the term, 'length,' of the body is here meant the length of the stem of the body constituted by the head, neck and trunk; that is to say, the distance from the top of the head to the line joining the ischial tuberosities, or stem-length of animals, and was chosen as the first object for investigation in order that any results which were obtained in Man might be comparable with those obtained in other species.

"The length (l) is measured by seating the subject on the floor or on a low table (not a chair) with the back against the wall. Care is taken to see that the sacrum is in contact with the wall, and the legs somewhat drawn up so that the individual sits fairly upon his ischial tuberosities. Under these conditions, the height of the top of the head gives a true measurement of the length of the body, and one which is constant and incapable of variation by the subject. If a chair or other form of seat be employed in taking this measurement, the individual can, by 'sitting low' or 'sitting high,' produce, at will, a variation of as much as three or more per cent. But, since a subject, conscious that he is being measured for height, tends naturally to produce a full measurement, it will be found that he intentionally 'sits up,' straightening the spine, tilting the pelvis forward, and rests on the contracted muscles of the thighs and buttocks instead of on his ischial tuberosities. The apparent length — 'sitting-height,' as it has been termed, — is thus increased by between two and three per cent. above the measurement taken in the manner already described. Accordingly, measurements taken on a seat require to be corrected down appropriately before they can be treated as comparable with the measurement of body-length in infants or animals." Walker took the mean of the two and three per cent. limits of variation which he noted, *i.e.,* two and five tenths per cent., as the amount to be deducted from the average sitting heights in Schuster's 1500 Oxford graduates to obtain the true value of the average body-lengths for the groups. He also corrected for the clothes without boots, *i.e.*, the excess which Schuster included in his records.

The arguments for taking as the body-length the stem-length rather than the stature, may here be summarized:

1. A measurement permitting comparisons between man and other species (Walker 1916 and Pfaundler 1916).

2. The stature is an "impure measure" (Pfaundler, 1916), because of the unknown amount of compression of the intervertebral disks (also emphasized by Von Pirquet, 1916), of the unknown degree of the vascular and tissue turgor, of the varying fat layer in scalp and soles, of the variations in the angle of the trochanteric neck, and of the varying curves of the spinal column (also remarked by Von Pirquet, 1916), of unrecognized or unmeasurable pathological (rachitic, malacial) shortenings of the leg bones (W. R. Miles, 1920, unpublished).

3. Easier to measure than the old Stammlänge, to the first coccygeal vertebra.

4. We may add, the avoidance, clinically, of the frequent procedure of allowing for the height of the heels, which vary in thickness more than the clothing on which the subject may sit.

*Schuster's Studies.* Before proceeding to Dreyer's work, it seems worth diverging for a moment to Schuster, 1911, whose figures for sitting-length were adapted for stem-length and discussed by both Walker and Dreyer. Schuster reported a statistical survey of the physical development of 1500 Oxford undergraduates, for which he cherished the noble ideal that it would in itself have a permanent value as a record which might be compared with similar records obtained in other places and possibly in future ages. It is interesting in passing to note the observations which he recorded: Spot pattern test, acuity of vision, lung capacity, strength of pull, six head measurements, and (what interests us here) weight, total stature, and sitting height, though he did not use this term nor emphasize its probable significance. It is disappointing, however, to find that for our present purpose his records are not of value.

1. The chest-girth, already repeatedly urged in the literature by Allaire, 1863, and Bornhardt, 1886, to mention no more, was totally omitted.

2. As regards stem-length, he neither used the term nor measured that character. What he measured was the standing stature, the length of leg and the length of thigh, and, by difference, the "sitting height." This character was found by Walker, 1916, on the average two and five tenths per cent. above what he called the true "stem-length."

*Dreyer and Hanson's Work.* Many ingenious ideas and practical tables for predicting weight are to be seen in the convenient little book published by Dreyer and Hanson in 1920. This represents the development of Dreyer's 1919 article in the *Lancet*. Its most striking principle is the substitution of "stem-length" for the usual standing height. As to the manner of observation, these two authors gave, in 1920, the following directions, which seem a useful addition to Walker's directions, already quoted.

"The subject places the backs of the fingers upon the platform on which he sits, and, with the fingers pointing backwards and the knees flexed, lifts the lower portion of the body gently backwards until the lowest bony portion of the os sacrum is in contact with the front of the measuring standard. The back is then straightened until the back of the head comes into contact with the standard. It will be found that different persons require to bend the knees in different degrees in order to achieve this position. The head should be tilted neither up nor down, and the eyes should look straight forward."

In using Schuster's figures on sitting height, Dreyer reduced them to stem-length (which he called "lambda") by three per cent., which he had observed to be the more constant difference, rather than Walker's two to three per cent.

In Dreyer and Hanson's book, the formula for predicting weight from stem-length (in males) was:

$$W \text{ (in kg.)} = 0.38052 \times \sqrt[0.319]{\text{Stem-length (in cm.)}}$$

The work of previous students Dreyer dismissed with little further evidence than the curt statement that most of the existing tables dealing with the size of the normal human body were based on the theory of definite relations between age, height, and weight; while he believed that he had satisfactorily proved that such relationships do not exist when individuals varying widely in size are examined, and on the other hand, that definite relationships do exist between the weight of the body, the length of the trunk, and the circumference of the chest. Evidence for the validity of this statement he offered merely in the equally curt *ex cathedra* dictum that the data from which he and Hanson had calculated their tables were "derived from the analysis of a number of observations sufficient to insure a degree of accuracy that should prove entirely satisfactory." While it was not claimed that the constants employed for the various indices given in these tables were to be regarded as fixed and final, the claim was made that "any changes they may have to undergo in the future, as a result of the further accumulation of data, will be small and not likely to impair their present validity from the practical point of view." No test was published of the error of the new formula, much less comparison of this error with that resulting from the use of the methods previously proposed by others. Furthermore, the number of measurements which he actually reported, against which we can make such tests, comprised only sixteen subjects, *i.e.*, a very small group. His data were obtained from men and boys who were "carefully selected on account of their physical fitness," though he did attempt to cover a widely different range in weight and height. These tests we have made and will report in a separate paper.

Owing to this important omission, one feels inclined, despite careful examination of his earlier work on a surface formula, first in relation to blood volume and then later in relation to vital capacity and to weight, and despite his originality and the superlative percentages, to agree for the present with the principles at the root of the comment made on his 1911 paper by Boycott 1911, which follows: "It will, however, be observed that the wild animals used were even less representative than the tame animals dealt with in their earlier memoir (1910) . . . the largest animal in no case being twice as heavy as the smallest. While, therefore, their formula represents their experimental data in an extremely satisfactory manner, a good deal better, for example, than the method used above (by Boycott), I am still of the opinion that it is liable to be misleading when applied to individuals differing widely in weight from those investigated by them, and that their data are not sufficiently comprehensive to establish the general proposition that the blood volume of mammals is a function of the surface."

Similar reservations were made by Kisskalt, 1912, 1914 and 1915; and may be inferred from examination of textbooks on pharmacology published after 1914, *i.e.*, subsequent to the articles by Moore and Dreyer. For instance, dosage according to surface, is not even mentioned in the manuals by Arny 1917, Wilcox, 1917, Cushny 1918, Bastedo 1920. The only textbook found, referring to surface as an index, is that by Sollmann, 1917, which states that "other things being equal, the effect of a given dose is inversely proportional to the weight of an individual (exclusive of the adipose tissue). It is rarely necessary to make allowance for the weight in adults (twenty to sixty years), but it may be used for calculating the doses for children. Body surface is regarded by some as a more accurate, although less convenient, index of the dose (Moore, 1909; Dreyer and Walker, 1914); but the subject is in dispute (Kisskalt, 1915)."

The practical application of stem-length, in connection with the circumference of the chest, to the judgment of the normality of a person's weight, will be treated shortly in this journal.

We are indebted for aid in tracing references, to Miss M. E. Campbell of the Boston Medical Library.

# IMPRESSIONS CONCERNING THE ETIOLOGY OF RICKETS AMONG THE ITALIANS.

By Bessie Talbot Strongman, M.D., Boston,
and
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[From the Boston Floating Hospital.]

It was reported that rickets has become more prevalent recently among the Italian children of

Boston than heretofore. Statistics are wanting to substantiate this, and the statement would seem doubtful because of the recent tendency towards healthier children due to the Infant Welfare work. However, no one will dispute that there is a deplorable amount of rickets among the Italians, who, in their own country, are normally free from this disease. The handicaps of the rachitic are too well known to need comment. Prevention of the pelvic deformity in women would be of economic value to our nation. The problem seemed well worthy of investigation. The results of the short season's work would seem to indicate numerous contributing factors rather than any one definite cause. We are but submitting what we have found as impressions, with apologies for the incompleteness and lack of figures. The information has been gleaned from homes by personal observation and with the aid of interpreters.

If large families, crowded and dirty living quarters, lack of sunshine, or diet of low energy quotient, were either collectively or individually responsible for rickets, other races would presumably be equally afflicted. But the Hebrews and Poles are, for example, in spite of these very things, markedly free from rickets. There must be some racial way of life, in the case of the city-dwelling American-Italian, to account for the incidence. In our rural and suburban communities we find but little rachitic deformity among the Italians, as compared with that of the urban population. These people outside of the cities, doubtless get more green vegetables and potatoes and possibly more milk, and surely they cannot duplicate the living conditions of the tenements.

Generally speaking, we have found certain tendencies and habits fairly widespread among the Italians, although they vary somewhat according to the part of Italy from which the people came, and also with their social and economic status. Early marriages give a maximum child-bearing period. Little attention is given to prenatal care. The puerperium is notoriously of the ambulatory type. Nursing is unduly prolonged—first, as the only means of birth control available to the people of an Orthodox faith; and secondly, because of the economy and convenience and the desire to give the baby whatsoever it wants. There is but little discipline. The people truly love their children. With the prolongation of lactation, pregnancy frequently occurs: this cannot fail to have its effect upon all three concerned. Unless the weaning is supervised by some social organization, it is usually abruptly to the adult diet, which is too highly seasoned and altogether unsuitable for children, besides the deficiencies which are to be discussed below.

Spaghetti, macaroni, and other similar products, and white bread are the main foods found on the tables; these are all of a highly milled wheat, lacking in vitamines. Today, all the macaroni on the market is of domestic manufacture as contrasted with pre-war times, when the greater part was imported (121,000,000 pounds from Italy in 1914). Macaroni (the term is used to include spaghetti, vermicelli, etc.) is being more widely used today than ever, because of the high cost of meat and potatoes. This American macaroni is from a flour which is entirely deprived of the vitamines. Analyses of macaroni would seem to show that formerly it more nearly approached whole wheat and the Grocers' Encyclopedia states that imported macaroni is approximately equivalent to middlings and therefore would contain bran. Assumedly, American macaroni and white bread are not suitable unless supplemented with an adequate mixed diet. Moreover, we have found that the macaroni is frequently undercooked—the Dietetic Bureau and other workers corroborate this statement. Habitually the macaroni products are served with oil: this delays the splitting up of the starch until after the pancreatic and biliary secretions have removed the fat film. The starch, which forms the main item of diet, is therefore, we find, too highly milled, undercooked, and unwisely savored.

The fats employed are olive oil or the American cotton seed product substitute—the latter in an increasing amount. These are entirely deficient in the fat soluble vitamine. The animal fats are used only incidentally in the meats, which are sparingly used, and are in such small quantities as to be negligible. Milk is unpopular among the Italians—we found less than one cup per child in many households—cheese is used sparingly, and butter is not found. However, the milk stations report an increasing demand for milk in the North End district. A deficiency of fat soluble vitamines must be serious. The efficiency of cod liver oil has been demonstrated by the recent work of Howland, as reported at the last meeting of the American Pediatric Society (abstracted in *J. A. M. A.*, July 17, 1920) and also in the recent relief work in the near East. We are greatly indebted to Dr. Percy R. Howe, who showed some interesting experimental animals at the Forsythe Dental Infirmary, which he has fed on a diet free of fat soluble vitamines. His work has been conducted primarily for the changes in the teeth. Incidentally, he has demonstrated bone decalcification with this diet and recalcification when the animal fat is supplied. We recall that the teeth of many of these rachitic children are very imperfect. He was unable to procure viable young from females who were on a deficient diet during pregnancy, but did produce rachitic offspring from some who had been on this diet up to the time of pregnancy.

As we have seen the diet in the homes we find a deficiency in vegetables and protein. Dietitians who work among the Italians are agreed to this. Meat, eggs, fish, and fresh vegetables are too expensive to be used. The minimum estimated cost of maintenance diet in August, 1920, for a family of two adults and three children was $12.50 to $15.00 per week (Dietetic Bureau, Boston, Mass.). The entire weekly budget of necessary expenses was $28 to $38 for this family. Many of these people have families which are out of proportion to the incomes. Where economy in food is practised, there is not only a tendency to low calories, but a great reduction of protein, iron, vitamines, etc.

The Italian mothers are very busy with their large families; frequently they do piece work in their homes. They cannot prepare individual dishes for the children. A single kettle of food, usually macaroni with some sort of vehicle, serves for the day's fare. They put into the kettle what they have in the house, not following any given receipt, and without regard to food values. The children are not trained to eat what is before them at regular intervals, but come and go as they please, eating what they want. We think that the younger children in large families are apt to be more rachitic than the older, increased maternal fatigue and crowding of the home, perhaps, being factors.

The housing is unfortunate. The rents seem quite out of proportion to the benefits—fully as much per square foot as in many of the better localities where janitor service is supplied, where there is at least one complete bath for each family, and where repairs are kept up. That the windows are kept closed by these people from the first frost on throughout the cold weather is, however, not the fault of the landlords. Most of the children of the pre-school age are confined to the homes during the winter. A veterinary knows that puppies will not thrive if no sunshine reaches them, and we all know that sunlight is an essential for plant growth. The houses are very crowded. This is due, in part, to the boarders—the surplus of Italian men in this country without families. The Police Department of a nearby city enforces a rule that not more than four persons shall be permitted to occupy any one room.

It seems hardly fair to ask the Italian housewife to give up her Italian cookery for the detested oat meal, etc. It is hard to urge these thrifty people, who are saving diligently for a farm or a little shop, to spend more on food, but the following will show that these fairly representative meals are poorly balanced, and show certain deficiencies. These are taken from receipts gotten out by the Dietetic Bureau—actually more macaroni would be used with the same quantity of other ingredients. The calories show that these would serve only a small family.

POUNDS.

| | PROTEIN | FAT | CARBOHYDRATE | ASH | CALORIES |
|---|---|---|---|---|---|
| 1 lb. macaroni | .134 | .009 | .741 | .013 | 1,665 |
| 1 lb. tomatoes | .012 | .002 | .040 | .006 | 105 |
| 1 oz. oil | | .063 | | | 242 |
| 2 oz. onions | .002 | .0004 | .012 | .0008 | 28 |
| 2 oz. cheese | .034 | .031 | .0016 | .0006 | 114 |
| TOTALS | .182 | .1054 | .7946 | .0104 | 2,154 |

POUNDS.

| | PROTEIN | FAT | CARBOHYDRATE | ASH | CALORIES |
|---|---|---|---|---|---|
| 1 lb. dry bran | .225 | .018 | .596 | .035 | 1,605 |
| 2 lbs. potatoes | .044 | .002 | .418 | .026 | 970 |
| 1 oz. oil | | .063 | | | 242 |
| 6 oz. onions | .006 | .0012 | .036 | .0024 | 84 |
| 1 lb macaroni | .134 | .009 | .741 | .013 | 1,665 |
| TOTALS | .409 | .0932 | 1.791 | .0704 | 4,366 |

POUNDS.

| | PROTEIN | FAT | CARBOHYDRATE | ASH | CALORIES |
|---|---|---|---|---|---|
| 1 lb. rice | .080 | .003 | .790 | .004 | 1,630 |
| 4 lbs. cabbage | .096 | .018 | .336 | .06 | 870 |
| ½ lb. soup meat | .107 | .040 | | .0045 | 370 |
| TOTALS | .283 | .061 | 1.126 | .0685 | 2,870 |

NOTE.—If made with macaroni in place of rice, the values are practically the same.

We should learn to advise diets for the children which are known to Italian cooks and palatable to them. This would not be difficult for trained workers. The domestic science courses in the schools will be of inestimable value in the next generation. Over the whole, one cannot but feel a subtle process of Americanization —possibly the feministic movement. We think that the Italians will adapt themselves to conditions as they exist here, that families will be limited by income and that eventually we will no longer see the rolling, rachitic gait; but we should do our utmost to tide them over until they have so adapted themselves.

Bibliography.

Sherman and Gillett: Adequacy and Economy of Some City Dietaries—The New York Association for Improving the Condition of the Poor. Publication No. 121.

Howland: Abstract of Proceedings of American Pediatric Society. Jour. A. M. A., July 17, 1920.

## Book Review.

*The Shibboleths of Tuberculosis.* By Marcus Paterson, M.D. New York: E. P. Dutton & Co.

To anyone interested in the tuberculosis problem, this book is fascinating in the extreme. The title itself fills one with curiosity which is stimulated to a still higher pitch on reading over the titles of the fifty-nine short chapters. The following are typical examples: "That Sanatoria are no good," "That the Superintendent of a Sanatorium has a 'cushy' job," "That pine trees are necessary in the treatment of Tuberculosis," "That exertion causes Haemoptysis," "That a sea voyage is good treatment for Tuberculosis," "That good housing will eradicate Tuberculosis," etc., etc.

Throughout the entire book the very vivid personality of Dr. Paterson himself is strikingly in evidence, as is likewise his firm belief in the value of the opsonic index as taught by Sir Almroth Wright and in autoinoculation as carried on by Dr. Paterson himself.

There are several statements made by Dr. Paterson which will not bear analysis but which are none the less interesting reading. For instance, he devotes two or three chapters to prove that climate has no special value in the treatment of tuberculosis, and to support this argument quotes figures showing that the death rate for tuberculosis is higher in Colorado and California than it is in many more crowded parts of this country and of England. Dr. Paterson knows, and if he does not know, he certainly should know, that the cause for this increased death rate in the two above-mentioned states is to be found in the great influx of advanced and dying consumptives who are sent there in the vain hope of a cure. It is quite foolish of him, or indeed of anyone else, to maintain that climate has no value in the treatment of tuberculosis. Because, for instance, the incidence and death rate of tuberculosis in Egypt is high, doubtless due to the faulty hygiene and methods of living of the natives, does not prove in the slightest that the dry climate of Egypt is not good for certain cases of consumption.

He devotes a chapter to proving that haemoptysis is never caused by exertion. To those of us who during the past winter have been able, in our own minds at least, to explain satisfactorily numerous pulmonary hemorrhages by unwise exertion on the part of patients, such as the shoveling of snow or coal, his argument that exertion is no factor in the causing of such hemorrhages is not impressive. If he stated that in active ulcerating tuberculosis where the process is steadily advancing, and in so doing erodes a blood vessel, exertion or exercise is a factor of no moment, we would all agree with him, but he does not state this, although he doubtless believes it.

He is evidently a firm believer in blood inoculations into guinea pigs as a diagnostic measure. This has practically been given up in this country. As above stated, his infinite faith in the treatment of tuberculosis by autoinoculation is very evident, and he holds up to some ridicule a certain very prominent American physician, an authority on tuberculosis, who is an equally strong advocate of rest, and opposes autoinoculation in any form and graduated exercises as carried on by Paterson. The truth probably lies midway between the two extremes. He draws the distinction, which is a most important one, for those of us who live in New England to remember, that pure air does not necessarily mean cold air.

The book is full of epigrams and aphorisms. The following are good examples: "Changing a man's work is not treatment"; "It is not the diet that matters so much as the inducing the patient to partake of it"; "Fatness does not increase the specific resistance in tuberculosis"; "It is not the buildings of a sanatorium that matter, *but the man in charge of them*"; "Many homes for tuberculosis exist, but few sanatoria."

It is easy to go through this book and find many points with which to disagree. It would be difficult, however, to find a book which on the whole would be more refreshing and more stimulating than this one.

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## ACTIVITIES OF THE HARVARD CANCER COMMISSION.

CONSIDERABLE publicity has been given of late to the contemplated addition to the Collis P. Huntington Memorial Hospital for Cancer Research, in which will be installed a new type of x-ray apparatus.

The Huntington Hospital, it will be remembered, is directly under the management of the Cancer Commission of Harvard University. The Commission has been attacking the cancer problem from two widely divergent angles. From the clinical point of view, the Staff of the Hospital has been actively engaged in applying known methods of treatment to actual cases of cancer. This has been done largely by the use of radium emination, combined, in many cases, with operative treatment. In the laboratories of the Commission, investigations have been carried on under the direction of Dr. Bovie, Research Fellow in Biology, bearing upon the fundamental facts of radiation. Investigation of the distribution of radiation about tubes of radium emanation, and the study of the heat-sensitization of paramecia to fluorite rays represent the type of work done in the laboratory. Dr. Duane, Professor of Bio physics, has developed, in his laboratory, an arrangement of apparatus which applies to the x-ray tube a constant difference of potential of 150,000 volts. This voltage produces x-rays which closely resemble the gamma rays (the hard, penetrating rays) of radium. These rays are able to penetrate living tissue much more effectively than the rays produced by the apparatus in general use, and at the same time with much less destructive effect upon the surface tissues. This new type of x-ray machine, which costs only about $5,000, will be installed in the new wing of the Huntington Hospital. Inasmuch as it will supply radiation similar to that of radium, but in much greater quantity than is yielded by the amount of radium now at the disposal of the Cancer Commission, cases suitable for x-ray treatment can be much more effectively treated than at present, and at the same time much radium emanation will be freed for use in cases in which x-ray is unsuitable.

Unfortunately for these sufferers from cancer who might benefit from the increased facilities of the Hospital, the work upon the new wing has been greatly delayed by the strike in the building trades. It is impossible to say when the work will be accomplished.

The development of therapeutic measures against cancer, the most terrible of all ills which beset human flesh, encourages us to hope that some day we will not have to stand by, with hands tied, as is now so often the case, utterly unable to prevent the progress of the disease. The most important step in the management of the cancer problem is now and always will be, early diagnosis. The situation is well stated by Dr. Greenough, Director of the Cancer Commission, in the last annual report.

"As the study of cancer continues, the possibilities of a universal remedy for the disease diminish. The more closely the disease is studied, the more intimately is it found to be involved in the process of life itself. At the present time, the best program for the control of cancer demands the concerted action of many different individuals. The public must be taught to recognize the symptoms of early cancer and to present themselves promptly for examination. Physicians must be taught to recognize the disease in its early and curable stages, and facilities for operation must be made available for everyone afflicted with this disease."

## MEDICAL NOTES.

Belgian Physicians in American Educational Institutions.—Three medical men are among the twenty graduate fellows recently appointed by the *Fondation Universitaire* in Belgium to take advanced courses in American institutions of higher learning. They are: Albert de Galuwe, M.D., of the University of Louvain, who comes to this country to study abdominal surgery, and who was attached to the Belgian medical service in the war, being three times mentioned in despatches from the front, and winning the Belgian War Cross, Yser Cross, Victory Medal and Commemorative Medal; Albert Govaerts, M.D., University of Brussels, Secretary of the Belgian Eugenics Society, who desires to study eugenics, with the object of developing that science in Belgium; Henri Magos, M.D., University of Louvain, who comes to gain a closer knowledge of gynaecology and obstetrics, and abdominal surgery. Two of the four Belgian fellows of last year, who have been granted a year's extension of their study in the United States, are Jean Bigwood, from the University of Brussels, who is taking a course in internal medicine at Johns Hopkins, and Paul Martin, also from Brussels, who is studying surgery.

The twenty-four exchange American fellows to Belgium will be named by the heads of thirteen American universities and commissioned by the Commission for Relief in Belgium Educational Foundation, of which Herbert Hoover, Secretary of Commerce, is president. This organization, and the *Fondation Universitaire*, came into being at the liquidation of the Commission for Relief in Belgium, shortly after the armistice.

Forty-eight exchange graduate fellows are to be named each year. The American fellows may choose for the seat of their courses either the Universities of Brussels, Ghent, Louvain, Liége, the School of Mines and Metallurgy at Mons, or the Higher Colonial School at Antwerp. The Belgian fellows are free to attend any American University.

The American fellows must be citizens of this country and have a reading and speaking knowledge of French. They will be selected by the heads of the following universities: Harvard, Yale, Pennsylvania, Princeton, Columbia, Massachusetts Institute of Technology, Cornell, Vassar, California, Smith, Johns Hopkins, Chicago, and Leland Stanford, Jr. They will be picked from one of these three classifications:

1. Members of the faculty below the grade of associate or full professor, including persons on leave.

2. Research students. Persons now or formerly enrolled, and holding a technical degree in their special fields, or who have had equivalent training.

3. Graduate students who desire to pursue some particular branch, and intend to adopt teaching or research as a profession.

Men and women are equally eligible as candidates for the fellowships.

Man-Made Diseases.—Many of the diseases that afflict man may almost be said to be made by him, says the U. S. Public Health Service, for they are spread, almost altogether, by his disregard of the simplest rules of sanitary living.

Typhoid fever, for instance, is spread by the contamination of water, milk, and food, by human filth which has been run into rivers or wells, or left exposed for flies to carry to the kitchen or dining room, or which, even more disgustingly, is carried to food directly from soiled hands.

Hookworm disease and other intestinal diseases are spread, to some extent at least, by the states which allow road-building gangs to work under conditions which, too often, compel them to scatter pollution, to be carried by flies to their own kitchens or to be ground into the soil, to be picked up by the bare feet of the children. Practically all hookworm disease is due to soil pollution.

Malaria, too, is often spread by the ignorance and carelessness with which mosquito breeding places are created or disregarded. Barrow-pits, dug to obtain stone for road work and other needs, and left to fill with water, furnish homes for thousands of wigglers; culverts, improperly placed, produce pools that are equally prolific; ditches that are clogged, and never cleared out, are popular and populous; railroad and other embankments that stop or check the flow of water, create conditions that are ideal—from the mosquito point of view.

Dr. T. F. Abercrombie, health officer of Georgia, has suggested that the convict, and other gangs, who work along the roads, be required to fill up barrow-pits, place culverts properly, clean ditches, and attend to other small but important details that any man can do, and that will deprive the mosquito of many of her breeding-places.

To accomplish this along the roads is more important than it may seem, for a mosquito, hatched at the roadside, does not have to wander in search of food: all she has to do is to wait for food to come to her. Moreover, if she is of the anopheline species, which spreads malaria, she has excellent chances both to acquire the malaria germs and to pass them along. Until she bites someone who has the disease, her bite, though no more pleasant than that of any other mosquito, is not any more dangerous. But a single malaria patient, driving along a ditch-bordered, mosquito-infested road, may provide hundreds of the insects with germs, which may pass on to every traveller along that road.

Dr. Abercrombie, by making the roads of Georgia safe for man, may materially reduce the malaria hazard of the State, and, according to the Public Health Service, his example deserves to be followed.

STATE LAWS CONCERNING CHILDREN.—In view of the number of states in which children's code commissions are at work, the U. S. Public Health Service calls attention to a recent report by the National Child Health Council, which recommends certain provisions that are apt to be overlooked.

Most important of all, it urges that all restrictions on local expenditures for the health of mothers and children should be repealed, and that definite facilities for the education of prospective mothers, their protection in industry, and the supervision of their health, should be definitely authorized.

The State Health Department should be authorized to license and supervise all midwives, and to require the immediate reporting of all inflammatory conditions of the eyes of the newborn and their proper treatment. Births, including still-births, should be promptly reported to local registrars under the Health Department. All maternity homes should be licensed and supervised.

Supervised pasteurization of all uncertified milk, and its proper handling, etc., should be required.

Health education should be provided for all school children. It should not prescribe rigid or uniform drill or instruction, but should normally stimulate the child's physical development and should include practical instruction in personal hygiene, nutrition and sanitation. Teachers should be instructed in the fundamental principles of health education. Periodic physical examinations should be made. Special groups who are unable to receive class instruction, should not be forgotten. The sanitary condition of school buildings and grounds, and their environment, should be supervised.

The child in industry should be physically examined when he leaves school, when he changes his work, and periodically while he is of school age.

Each state should have a Bureau of Child Hygiene, which should administer the laws for children. All public and private institutions, having to do with children, should be subject to regulation by the health authorities. All appropriations for child or maternity care should provide specifically for health.

CHILD HYGIENE WORK OF GENERAL INTEREST.—A report on a year's work in child hygiene, carried on by C. P. Knight, of the U. S. Public Health Service, in coöperation with the State Board of Health of Missouri, and with all private associations interested in the work, shows results of much general interest.

In sundry cities, a house-to-house canvass was made, to determine the percentage of birth registration, the sanitary condition of the home, the amount of milk used, the relative income, and the relation between prenatal influence and infant mortality. The parents were greatly interested in the work, and helped unhesitatingly. Better health supervision of young children, and the correction of much improper eating and sleeping habits resulted.

In other cities, school hygiene was begun by weighing and measuring the children. The results stirred up a friendly rivalry among the children, to see which could first reach the proper average. Many mothers attended talks given by Parent-Teacher associations, and learned that when a child was under weight (7 to 10 per cent. below average) and did not gain as he should (half a pound a month, between 8 and 12 years of age) it was probably due to some physical defect, or to faulty living.

With the mothers' consent, under-weight children were examined physically, and both child and mother were questioned in each other's presence. Many physical defects and faults, such as late bed time and improper eating, were disclosed. Suggestions as to how the troubles might be rectified, were followed up by a public health nurse, who visited the homes and urged the remediable measures. Everywhere, both parents and physicians warmly coöperated in the work.

Rural school surveys showed that, though the country child had the advantage of fresh air and out-door life, he usually sleeps with closed windows, and subsists, especially in fall and winter, on pork, hot biscuits, gravy, and sorghum. In the summer, he has home-grown vegetables. Adenoids and decayed teeth pass unnoticed, or are neglected because of lack of facilities.

Demands from many parents that their children be weighed and measured, led to the opening of many child health centers, to which clinics for teeth, eye, and orthopedic defects were added. A community nurse began classes for mothers and expectant mothers, teaching them to care for themselves and for their babies. Follow-up work included monthly letters to expectant mothers and, later, a similar series on the care of the baby. By this means, interest in birth registration was aroused and data obtained for supplying it.

Mental Defects in School Children.—"The prevention and correction of mental defectiveness," says the U. S. Public Health Service, "is one of the great public health problems of today. Its influence is continually cropping out. For instance, recent studies have shown that feeble-mindedness is an important factor in prostitution, and that a marked proportion of juvenile delinquency is traceable to some degree of mental deficiency in the offender.

"A recent state-wide survey in Oregon shows that more than 75,000 men, women, and children, out of a total population of 783,000, are dependents, delinquents, or feeble-minded, and that more than 500 school children, out of a total enrolled school population of 32,500, are more or less mentally deficient. The latter fact is significant when it is remembered that the condition of the children of today is the best possible index to the condition of the community of tomorrow.

"The Oregon figures are considerably lower than the average shown by the draft examination, indicating that they are certainly not higher than those that would be obtained in other states."

Maternity and Child Welfare.—The following notice appeared in the London, England, *Daily Telegraph*, March 26, 1921, and is of interest to those studying problems referred to:

"In view of inquiries from local authorities and others interested, the Ministry of Health has issued a revised list, with index, of maternity and child welfare centres in England and Wales, including, for the first time, a list of day nurseries. The list contains the names and addresses of 735 centres and 140 day nurseries conducted by voluntary societies, and of 1,188 centres and 44 day nurseries conducted by local authorities. At about 150 of the centres, special dental treatment is provided, while others have special arrangements for eye and ear treatment. While the centres in the first part of the statement are primarily consultation centres for nursing mothers and children, under five, some are fully equipped for ante-natal consultations. There are now separate lists for residential and non-residential institutions.

"The Ministry advises that consultation centres should be reserved for healthy women and children, and that, where possible, treatment should be given at special treatment centres, which may be established at a hospital or combined with a school clinic, and may take cases from a number of consultation centres. The list has been specially looked forward to by maternity and child welfare workers, to whom, as well as to local authorities and others, it will be of great practical value, particularly in enabling them to refer mothers leaving their district to the appropriate centre in another district."

Walter B. Swift, A.B., S.B., M.D., of Boston, now Instructor in Speech Correction in the Froebel League in New York City, has just been appointed "Lecturer on Speech Development and Correction" in the Northwestern University, Evanston, Illinois. He will begin summer courses there on June 27.

## BOSTON AND MASSACHUSETTS.

The District Nurse Bill.—It will be unwelcome news to many to know that Chapter 40, Section 5, Paragraph 21, of the recent codification of state laws, provides as follows, under the specified amounts that towns may spend:

"For the employment of district or other nurses: but not more than two thousand dollars shall be appropriated for such in any one year." The restriction is known to apply to Brookline and Framingham, and, probably, many other towns which have expended larger sums.

Representative Bowers, of Framingham, has just introduced a bill under suspension of the rules, which is designed to correct the restrictive features of this law.

REGISTRATION OF NURSES.—In view of the great shortage of nurses, it will afford encouragement to report that two hundred and eighty applicants for state registration appeared at the examination held April 12 and 13.

The Board of Registration of nurses has encouraged all nurses to apply who can show evidence of graduation from any reputable school, and has postponed strict compliance with the regulations governing training schools until January, 1922. A special examination will be given June 28, although the law does not require one at that time.

WEEK'S DEATH RATE IN BOSTON.—During the week ending April 9, 1921, the number of deaths reported was 227 against 255 last year, with a rate of 15.63 against 16.45 last year. There were 29 deaths under one year of age against 42 last year.

The number of cases of principal reportable diseases were: Diphtheria, 56; scarlet fever, 62; measles, 131; whooping cough, 23; typhoid fever, 1; tuberculosis, 48.

Included in the above, were the following cases of non-residents: Diphtheria, 12; scarlet fever, 7; whooping cough, 1; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 3; whooping cough, 3; tuberculosis, 16.

Included in the above, were the following non-residents: Diphtheria, 2; scarlet fever, 2; whooping cough, 1; tuberculosis, 2.

Smallpox, 3 cases reported.

Leprosy, 1 case reported.

TEACHING HYGIENE AT THE M. I. T.—Under the direction of Professor C. E. Turner, M. I. T., Cambridge, a course in methods of teaching hygiene and public health is offered by the Massachusetts Institute of Technology.

## Miscellany.

### THE AMENDED TOWNER BILL.

WE give below the text of the amended Towner bill.

It is quite evident that there is a growing interest in the question of maternal and infant welfare. This matter has, however, aroused much opposition, and the new draft seems to be free from many of the causes of contention found in the old bill.

Each state is free to accept or reject the coöperation features of this bill, and it does not seem to appear that a state must subordinate its interests. The reading of the bill seems to provide coöperation and not coercion.

Discussion of this measure is invited.

A BILL

For the public protection of maternity and infancy and providing a method of coöperation between the Government of the United States and the several States.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there is hereby authorized to be appropriated annually, out of any money in the Treasury not otherwise appropriated, the sums authorized in section 2 of this Act, to be paid to the several States for the purpose of coöperating with the States in promoting the care of maternity and infancy in the several States, to provide instruction in the hygiene of maternity and infancy, and the sum authorized in section 5 for the use of the Children's Bureau for the promotion of maternal and infant hygiene, for the administration of this Act, and for the purpose of making such studies, investigations, and reports as will further the efficient administration of this Act.

SEC. 2. That for the purpose of paying the expenses of said coöperative work in providing the services and facilities specified in this Act, and the necessary printing and distribution of information in connection with the same, there is permanently authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $480,000 for each year, $10,000 of which shall be paid annually to each State in the manner hereinafter provided. There is also authorized to be appropriated for the use of the States, subject to the provisions of this Act, for the fiscal year ending June 30, 1922, and annually thereafter, an additional sum of $1,000,000: *Provided,* That the additional appropriations herein authorized shall be apportioned among the States in the proportion which their population bears to the total population of the United States, not including outlying possessions, according to the last preceding United States census: *And provided further,* That no payment out of the additional appropriation herein authorized shall be made in any year to any State until at least an equal sum has been appropriated for that year by the legislature of such State for the maintenance of the services and facilities provided for in this Act.

So much of the amount appropriated apportioned to any State for any fiscal year as remains unexpended at the close thereof shall be available for expenditures in that State until the close of the succeeding fiscal year. Any amount apportioned under the provisions of this Act unexpended at the end of the period during which it is available for expenditure under the terms of this section shall be reapportioned, within sixty days thereafter, to all the States in the same manner and on the same basis, and certified to the Secretary of the Treasury and to the State agencies described in section 4 in the same way as if it were being apportioned under this Act for the first time.

Sec. 3. That the Children's Bureau of the Department of Labor shall be charged with the carrying out of the provisions of this Act, and the Chief of the Children's Bureau shall be the executive officer. The Chief of the Children's Bureau, as executive officer, is hereby authorized to form an advisory committee to consult with the Chief of the Children's Bureau and to advise concerning any problems which may arise in connection with the carrying out of the provisions of this Act, such advisory committee to consist of the Secretary of Agriculture, the Surgeon General of the United States Public Health Service, and the United States Commissioner of Education. The Children's Bureau shall have charge of all matters concerning the administration of this Act, and shall have power to coöperate with the State agencies authorized to carry out the provisions of this Act. It shall be the duty of the Children's Bureau to make or cause to be made such studies, investigations, and reports as will promote the efficient administration of this Act.

Sec. 4. That in order to secure the benefits of the appropriations authorized in section 2 of this Act, any State shall, through the legislative authority thereof, accept the provisions of this Act and designate or authorize the creation of a State agency with which the Children's Bureau shall have all necessary powers to coöperate as herein provided in the administration of the provisions of this Act: *Provided,* That in any State having a child welfare or child hygiene division in its State agency of health the said State agency of health shall administer the provisions of this Act through such divisions. The Children's Bureau may recommend to the State agencies coöperating under this Act the appointment of advisory committees, both State and local, to assist in carrying out the purposes of this Act; the members of such advisory committees shall be elected by the State agencies, and at least half of such members shall be women, all of the members of which advisory committees shall serve without compensation. If in any State the legislature of which does not meet in 1921, the governor of that State, so far as he is authorized to do so, shall under the provisions of the law accept the provisions of this Act and designate or create a State agency to act in coöperation with the Children's Bureau. The said Children's Bureau shall then recognize such State agency for the purposes of this Act until the legislature of such State meets in due course and has been in session sixty days.

Sec. 5. That so much, not to exceed 5 per centum of the amount authorized for any fiscal year under this Act, as the Children's Bureau may estimate to be necessary for administering the provisions of this Act shall be deducted for that purpose, to be available until expended. Within sixty days after the close of each fiscal year the said Children's Bureau shall determine what part, if any, of the sums theretofore deducted for administering the provisions of this Act will not be needed for that purpose, and apportion such part, if any, for the fiscal year then current in the same manner and on the same basis, and certify it to the Secretary of the Treasury and to the several State agencies described in section 4 in the same way as other amounts authorized by this Act to be apportioned among the several States for such current fiscal year.

Sec. 6. That out of the amounts authorized under this Act the Children's Bureau is authorized to employ, to be taken from the eligible lists of the Civil Service Commission, such assistants, clerks, and other persons in the city of Washington and elsewhere, to purchase such supplies, material, equipment, office fixtures, and apparatus, and to incur such travel and other expenses as it may deem necessary for carrying out the purposes of this Act.

Sec. 7. That within sixty days after the approval of this Act the Children's Bureau shall certify to the Secretary of the Treasury and to each State agency described in section 4 the sum which the Children's Bureau has estimated to be deducted for administering the provisions of this Act, and the sum which it has apportioned to each State for the fiscal year ending June 30, 1921, and on or before January 20 next preceding the commencement of each succeeding fiscal year it shall make similar certifications for such fiscal year.

Sec. 8. That any State desiring to avail itself of the benefits of this Act shall, by its agency described in section 4, submit to the Children's Bureau for its approval detailed plans for carrying out the provisions of this Act. These plans shall include the provisions to be made in the State for the administration of the Act the provision of instruction in the hygiene of maternity and infancy through public-health nurses, consultation centers, and other suitable methods. These plans shall be in conformity with the provisions of this Act, and reasonably appropriate and adequate to carry out its provisions. Due notice of approval shall be sent to the State agency by the Children's Bureau.

Sec. 9. That in order to provide popular non-technical instruction to the residents of the various States, particularly to those to whom such facilities are not accessible, on the subject of the hygiene of infancy, hygiene of maternity, and related subjects, the State agency described in section 4 is authorized to arrange with any educational institution for the provision of extension courses by qualified lecturers: *Provided*, That not more than 25 per centum of the sums granted by the United States to a State under this Act may be used for this purpose.

Sec. 10. That the facilities provided by any State agencies coöperating under the provisions of this Act shall be available for all residents of the State.

Sec. 11. That the Children's Bureau shall every three months ascertain the amounts expended by the several State agencies described in section 4 in the preceding quarter year. On or before the 1st day of January and quarterly thereafter the Children's Bureau shall certify to the Secretary of the Treasury the amount to which each State is entitled under the provisions of this Act. Upon such certification the Secretary of the Treasury shall pay to the State Treasurer as custodian the amounts so certified.

Sec. 12. That each State agency coöperating under this Act shall make such reports concerning its operation and expenditures as shall be prescribed by the Childern's Bureau. The Children's Bureau may withhold the allotment of moneys to any State whenever it shall be determined that such moneys are not being expended for the purposes and under the conditions of this Act.

If any allotment is withheld from any State, the State agency of such State may appeal to the Secretary of Labor, and if the Secretary of Labor shall not direct such sum to be paid it shall be covered into the Treasury of the United States.

Sec. 13. That no portion of any moneys apportioned under this Act for the benefit of the States shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings or equipment, or for the purchase or rental of any buildings or lands.

Sec. 14. That the Secretary of Labor shall include in his annual report to Congress a full account of the administration of this Act and of the expenditures of the moneys herein authorized.

## RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS.

### FOR JANUARY, 1921.

*General Prevalence.*

There were 9,251 cases of communicable diseases reported during the month, an increase of 1,332 cases over the previous month's total.

Anterior Poliomyelitis—There were but 10 cases during the month. This is the least number of cases that has occurred since June of last year, and probably marks the end of the epidemic of 1920.

Chicken Pox.—There were 1,454 cases this month, and 1,123 in December.

Diphtheria has increased slightly over last month, there being 965 cases reported, as against 943 in December.

However promising may be the outcome of the campaign of the Department for permanent immunization of children against this disease by means of toxin-antitoxin treatment, it is to be remembered that the result of this work will show in a lessened future incidence, and will not affect current prevalence. For control of outbreaks that have occurred, we must not forget our contacts (home, neighborhood and school). The most practical way in which the disease can be controlled by boards of health is by intensive work in locating the contacts of each case and culturing them to see if they are carriers or mild cases. If this method does not yield good results, the fault will be found to be from failure properly to pick the contacts; properly to culture them, or properly to isolate them (as well as the cases), during the time they have the organisms in their throats.

Epidemic Cerebrospinal Meningitis.—21 cases reported, compared with 28 in January, 1920, and 14 in December, 1920.

Measles.—An increase occurred, with 2,230 cases of the disease for January, against 1,876 in December.

Lobar Pneumonia prevailed in about the normal amount for this season of the year. This disease, however, is not yet fully reported. For instance, the fatality rate has been, uniformly, about 50%, based on case and death returns. This is much too high, and shows that all cases are not reported.

Scarlet Fever.—1,137 cases were reported in January, 1921; 1,714 in January, 1920, and 917 in December, 1920.

Pulmonary Tuberculosis.—590 cases in January, and 582 in December.

Typhoid Fever.—Only 38 cases were reported, which small number is not unusual in mid-winter.

Whooping Cough.—Not so many cases were reported as of measles. The number was 669. The disease is much more fatal than measles, and the amount relatively large.

# Correspondence.

## ON ADVANCING TELEPHONE CHARGES

Somerville, Mass., April 21, 1921.

*Mr. Editor:—*

The following letter of protest has been endorsed by the Somerville Medical Society and the Middlesex South District Medical Society at recent meetings. It was voted at the latter society to have the secretary notify all members of the date of the hearing when designated.

Yours truly,
H. E. Buffum.

Hon. William O'Brien,
Telephone and Telegraph Public Utilities Division,
State House, Boston, Massachusetts.

Dear Sir:—

The Somerville Medical Society, at their last regular meeting, appointed the undersigned a committee with full powers to notify those interested, of the proposed plan of the New England Telephone & Telegraph Company to increase the cost of telephone service to the physicians of Massachusetts.

The Company proposes to change the classification of the physicians from a residence rate, which has been in existence something over 20 years, to a business rate and, while technically there will not be a so-called change in rate, yet practically by the change in rating, all physicians will be compelled to pay much more for the service.

We know that the Company fully realizes that the present time would be inopportune for a general raise in rates, owing to the antagonism that would be presented throughout the state since the Company's recent advance of the dividend rate from seven to eight per cent. and the Parent Company (The American Bell Telephone and Telegraph Company) from an eight per cent. to a nine per cent. basis. Therefore, it seems that the New England Company hope to accomplish the same end by taking small numbers of subscribers and manipulating their ratings rather than their rates. The discrimination in making physicians pay business rates for a large share of the personal service while clergymen, other professions, and neighbors pay the residence rates for similar service seems hardly equitable, especially since residence rates for physicians have been satisfactory to the Telephone Company for so many years and was the Telephone Company's original proposal and position.

The Somerville Medical Society has authorized us to enter its protest to you against the action of the New England Telephone & Telegraph Company, and to ask for a public hearing on the matter if said proposal of the Company is to be considered favorably by your Board. The Medical Society would be grateful for the courtesy if, in the event of a hearing, sufficient time is given us to arrange for the notification of the different medical societies throughout the state who have not already taken steps to protest to your Board, also to reach individual physicians through notice in our weekly *State Medical Journal*. We hope that the legal and personal representation of the fifty-five hundred physicians of Massachusetts at such a hearing will convince your Honorable Board that the proposal of the New England Company is unwarranted and untimely.

For the Medical Society,
Eugene L. Maguire, M.D.,
Edmond H. Robbins, M.D.,
Herbert E. Buffum, M.D.

[The profession should be immediately and actively interested in the above letter of protest relating to the proposed rate of telephone charges. Each district society should arrange for coöperation in contesting this action of the company.—*The Editor.*]

## EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold an examination in Boston, June 14 to 21, inclusive.

Subjects: Anatomy, Clinical Physiology, Physiological Chemistry, Pathology, Bacteriology, Materia Medica and Therapeutics, Medicine, Surgery, Obstetrics and Gynecology, Hygiene and Sanitation. The certificate of the National Board is accepted as equivalent to a professional examination by the Federal Services and a large majority of State Medical Examining Boards.

Eligibility for examination: A four-year high school course, two years of acceptable college work, including physics, chemistry, biology and a modern foreign language; graduation from a Class A medical school, and one year as interne in an acceptable hospital or laboratory; application for examination will be considered from interne who had completed at least six months of interne service.

Applications should be made before May 25, to allow for proper investigation of credentials.

Information and application forms may be obtained from Dr. Horace D. Arnold, 520 Commonwealth Avenue, Boston. Dr. Arnold may be seen at his office from 4 to 5, Mondays, Wednesdays and Fridays, until May 25, or by appointment.

## SOCIETY NOTICES.

Essex North District Medical Society.—Annual meeting will be held in Russell Hall, Y. M. C. A. Building, 40 Lawrence Street, Lawrence, (Tel. 1260) Wednesday, May 4, 1921.

Dinner will be served at 12.30 o'clock, sharp.

After the dinner, the business meeting will occur at 1.45.

Following the business meeting, adjournment will be had to the gymnasium, and two moving picture films will be shown by the Department of Public Health of Massachusetts (1 hour 35 minutes) entitled "Modern Diagnosis and Treatment of Syphilis" and "Diagnosis and Treatment of Gonorrhea in the Male." They will be introduced by H. A. Streeter, M.D., Chief, Subdivision of Venereal Diseases, A. A. Surgeon, United States Public Health Service, in a very short talk on the venereal program in Massachusetts, at which time questions will be answered.

This society has raised its full quota for social entertainment of the A. M. A., June 6–10, in Boston.

Meeting of the Censors will be held at Hotel Bartlett, 59 Main Street, Haverhill, (Tel. 8710) on Thursday, May 5, at 2 p.m., sharp. Candidates should present their diploma to the Secretary one week in advance.

D. D. Murphy, M.D., *President*,
J. Forrest Burnham, M.D., *Secretary*.

Harvard Medical Society.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, May 3, at 8.15 o'clock.

Program: Alastrim in Jamaica—Dr. W. G. MacCallum, Professor of Pathology, Johns Hopkins University.

Massachusetts General Hospital.—A Staff Clinical Meeting was held in the lower out-patient amphitheatre on Monday, April 25, 1921, at 8 p.m.

The program: Adrenals—Dr. J. C. Aub, Assistant Professor of Physiology, Harvard Medical School. Dr. J. H. Means presided.

Doctors, nurses and medical students attended.

# The Boston Medical and Surgical Journal

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## Original Articles.

### VITAMINS IN MILK.

By M. J. Rosenau, M.D., Boston,

*Professor of Preventive Medicine and Hygiene, Harvard Medical School.*

Milk is rich in all of the known vitamins. We would rather expect this to be the case, for the mammalian suckling must depend upon milk as its sole source of food supply for a fairly long period of time. Milk, in fact, is the only single article of food that fairly represents a complete diet. Milk, however, is not "the perfect food" that it was once thought to be, especially when used as the sole food for adults; this is for the reason that it contains no roughage, is deficient in iron, and is so dilute that it requires clumsy amounts to furnish the necessary nutriment. Milk is unexcelled for growing children; it has no equal for the promotion of growth and nutrition. Furthermore, cow's milk is rich in calcium in a readily available form—children need five times as much calcium per kilo of body weight as adults. In order to supply this important salt to growing bones and developing teeth, as well as to furnishing vitamins for the utilization of food, a child should drink a quart of milk a day. It will not then suffer from a deficiency disease. In this sense, milk is well called a protective food.

Milk is not equally rich in all vitamins, but contains these essential accessory dietary factors in variable amounts. This is one of the newer facts that has recently been disclosed. Thus, Hart, Steenboch and Ellis,[1] and also Hess, Unger and Supplee,[2] have shown that the antiscorbutic value of milk depends almost entirely upon the fodder of the cow. Hess, Unger and Supplee have shown that cows that had been fed for a period of three weeks on fodder which was almost completely devoid of anti-scorbutic vitamin, produced milk that was almost devoid of this factor, although of normal caloric value and adequate in fat, protein and carbohydrate content. Hess, in his recent Harvey Lecture, stated that such results may have far-reaching dietary significance, and he raises the question whether "winter milk" supplied by stall-fed cows is a well balanced and complete food. It is quite possible that it may become a part of dairy inspection to know the adequacy of the fodder as well as the sanitary conditions. It is well known that the cows producing certified milk are not allowed to graze. It is now necessary to reëxamine the conditions surrounding the requirements of certified milk with reference to this very important factor.

Human milk, no doubt, also varies with the nature of the mother's food, and in some instances is deficient, owing to eccentricities of diet or to poverty. Alonzo Taylor, in his Cutter Lecture on Preventive Medicine and Hygiene, at Harvard, reported as a result of observations in the war zone, that babies fed at the breast of mothers who had a diet deficient in antiscorbutic vitamin soon developed symptoms of scurvy. Furthermore, that when a diet rich in antiscorbutic vitamins was given such a nursing mother, considerable time elapsed before they appeared in the milk; in other words, they were first utilized by the mother before there was sufficient to give to the baby.

The study of vitamins is still in its infancy. Much that is affirmed today may be denied tomorrow. We do not know the nature or composition of these "substances"—we know them only by their effects. It is clear that they are not amins, and therefore the term, from the chemist's standpoint, is ill chosen, but the word vitamin, introduced by Funk in 1911, is expressive and attractive, and is now firmly planted in the language.

Vitamins are synthetized in the plant kingdom and are not made in the animal world. Even such unicellular plants as yeast cells are able to produce antineuritic vitamin (water-soluble B). It is now clear that man is not able to elaborate vitamins, and he is also unable to store them; this applies likewise to other members of the animal kingdom, so far as the subject has been studied. This has a very important and practical consideration, for we live a hand-to-mouth existence so far as these essential dietary factors are concerned. It again proves that animals are parasites living upon the vegetable kingdom. In other words, our health, as well as our power to utilize food, depends upon the daily intake of these unknown dietary factors. Life itself is threatened by deprivation of them for any length of time. Hence, the vitamin problem is of daily and universal interest to all persons.

The quantity of vitamins in plants probably varies with the soil in which they are grown, and animals in turn suffer by lack of, or profit by richness of, vitamins in plant foods. One of the best instances of the relation of soil to plant composition is in the case of endemic goitre, which is due to a lack of iodin in food or water, or both. This is one of the clearest cut deficiency diseases brought about by the lack of a single element in food and drink. It can be prevented, and even cured, by the administration of small amounts of iodin. The classical work on this subject, by Marine, is convincing. Iodin, of course, is not a vitamin, and it is not likely that the chemical composition of vitamins, when disclosed, will prove to be a single element or even a simple compound.

At least three vitamins are now distinguished: (1) Fat-soluble A, which is responsible for xerophthalmia; (2) water-soluble B, or antineuritic vitamin, the lack of which causes beriberi; and (3) antiscorbutic vitamin, or vitamin C, the lack of which induces scurvy.

Milk is usually rich in all three of these vitamins. It is unusually rich in fat-soluble A, contains an abundant amount of water-soluble B, and a variable, but ordinarily sufficient quantity of antiscorbutic vitamin. It has, therefore, been well designated by McCollum, a protective food, in that it protects against all of the known deficiency diseases.

Mellanby's observations on dogs indicate that fat-soluble A is associated with rickets. These observations are accepted by the Medical Research Committee of Great Britain. Many now regard fat-soluble A as synonymous with antirachitic vitamin. It seems clear that this vitamin is a factor in rickets, but whether the dominant factor, is still to be determined.

In the present state of our knowledge, it is a safe rule to eat a varied and generous diet. This advice applies with special force to growing children. "Natural" foods should be included in the diet, especially milk and also eggs, green leafy vegetables, cellular organs of animals, and fruits.

Artificial color standards are responsible for at least one deficiency disease. The false notion that a substance that is white is also pure has misled entire nations into dietetic errors. This is especially the case with polished rice and beriberi. The term "pure white" is misleading. White foods are not necessarily clean foods or pure foods. This lesson, with reference to polished rice, highly milled flour, and other prepared articles of diet, usually of a carbohydrate nature, is still to be learned. It will take a long time for people to learn that things may look clean, but not really be clean; in other words, there is a distinction between biologic cleanliness and physical or aesthetic cleanliness. It took a long time for sanitarians to prove that there is no relation between odors and disease. We now know that our sense of smell is a poor sanitary guide. There is a similar situation with reference to our color sense. To depend upon the color of food is a false standard. In the present state of our knowledge, the natural color, whatever it may be, is probably the safest, and when the subject is properly understood, a grayish colored rice will look more appetizing than "pure" white. There can be no hygienic defense of the artificial coloring of food used to cover imperfections or to hide inferiority. The natural color of milk varies. "Winter milk" and milk of stall-fed cows is apt to be dead white, whereas the milk of pasture-fed cows has a yellowish tinge, and the butter made from such milk has the glorious golden hue of spring butter. It is well known that the most active fat-soluble vitamins are those contained in colored fats.

Unbalanced diets are not simply harmful in a negative sense because they lack something, but are positively harmful. Some years ago, when working upon the subject of beriberi, I found that chickens fed upon a diet of polished rice or some other cereal preparation consisting almost wholly of starch in a state approaching chemical purity, died quicker than control chickens given nothing whatever to eat; that is, the starving chickens lived longer than those having all they could eat of the above mentioned purified food stuff.

Most of the deficiency diseases are chronic, with long periods of incubation. There must, therefore, be a prolonged period of subnutrition during which the individual does not reach the threshold of clinical manifestations. During this time, such a person is "below par," is, perhaps, more susceptible to infection, and certainly has a diminished factor of safety. Hess states that, "Clear-cut disorders should not be regarded as the most common or important result of food deficiencies. It should be realized that a lack of these essential food factors generally does not bring about typical pathological states, but obscure alterations of nutrition, ill defined functional disabilities, which cannot be characterized or even recognized as disease. It is such incomplete larval forms of the deficiency disorders to which physicians will have to address themselves."

### INFLUENCES TENDING TO HARM VITAMINS.

In view of the facts above stated, it is clear that the stability of vitamins in our food has become a problem of fundamental importance. It is necessary to preserve foods in order to tide over the seasons, to feed metropolitan cities, and to promote development in non-agricultural regions. The ideal is to preserve food so that the vitamin content will also be preserved sufficiently for dietetic purposes. It has recently been discovered that it is possible to preserve almost any food by various processes so that the vitamin content is not injured to any serious extent. The age of the food has always been ascribed as an important factor, hence the emphasis commonly placed upon fresh food. Now we know that many foods, including milk, may be preserved in a way to conserve their original vitamins.

It has long been believed that drying, salting, and heating, which are the usual processes of preserving food, destroys the antiscorbutic vitamin, but the work of Hess makes it clear that oxidation is probably the prime factor; in other words, it is possible to dry, can or pickle food in such a way as to preserve sufficient of the antiscorbutic vitamin for all practical purposes. The antiscorbutic vitamin is the frailest of them all. Hess further clearly shows that neither the heating, ageing, or drying of milk seriously affects this vitamin in the absence of oxygen.

### EFFECT OF HEAT UPON VITAMINS IN MILK.

We studied the effect of heat upon the vitamins in milk, because of the importance of the problem from a practical and academic standpoint. Most of our work was concentrated upon fat-soluble A, but we give a summary of our present knowledge of the effect of heat upon the vitamins in milk, in which our observations are incorporated.

It has long been known that the effect of heat upon vitamins varies with the reaction and other factors. Most vitamins are more readily affected by heat in an alkaline medium than in an acid one. Fortunately, most of our foods are acid. Milk is acid from the time it leaves the udder. Fresh cow's milk has a $p^H$ value of 6.5 to 6.8; fresh mother's milk varies between 7.1 and 7.6. Owing to the formation of lactic acid, the hydrogen ion concentration increases as the milk ages.

In a recent article, Drummond[3] summarized our present knowledge of the effects of heat upon vitamins. The data is given in the following table.

| | Vitamins | | |
|---|---|---|---|
| Stability | Fat Soluble A | Water Soluble B | Antiscorbutic C |
| To temperature | Stable at 100° C.; probably stable at 140° C. | Comparatively stable at 100° C.; slowly destroyed at 120° C. and above. | Gradually destroyed above 50° C.; rapidly destroyed above 80° C. |
| To alkali | Stable in cold; possibly in hot. | Slowly destroyed in cold; rapidly in hot. | Rapid destruction even in cold. |
| To acids | Probably stable. | Comparatively stable. | Comparatively stable below 50° C. |

It is well known that fat-soluble A is very resistant to heat. Osborn and Mendel, and also McCollum and others, have shown that this vitamin found in butter fat will resist the temperature of live steam without destruction. Practically all observers agree that long boiling with acids does not harm water-soluble B (antineuritic vitamin). Dry heating at a temperature of 100° C., with free access of air, only very slowly destroyed fat-soluble vitamin. The results thus far obtained emphasize the importance of taking full account of the time as well as the temperature of heating, and of the initial concentration of the vitamin in the food, as well as of the opportunity for previous storage of the vitamin by the test animal. It is therefore clear that the heat used in pasteurizing, boiling, evaporating, condensing and drying milk has very little effect upon these two vitamins.

Our studies on the effect of heat upon fat-soluble A in a large number of samples of evaporated, condensed and dried milks confirm this fact. Dr. W. D. Bigelow, Director of the Research Laboratory of the National Canners' Association, by means of ether extraction, obtained milk fat in a high state of chemical purity from samples of evaporated and condensed milk. It was found that these chemically pure fats both prevented and cured xerophthalmia in rats with practically the same potency of the original preparations of evaporated and condensed milk from which they were obtained. The tests with the extracted fats were conducted by Dr. E. V. McCollum at the laboratory of the School of Hygiene and Public Health, Johns Hopkins University, while the control tests with the original evaporated, condensed and dried milks, were made by the writer of this article in the laboratory of Preventive Medicine and Hygiene, Harvard Medical School.

With regard to the effect of heat upon antiscorbutic vitamin, it has been shown that the duration of the heating process is of greater importance than the degree of temperature to which the food is subjected; for example, Hess states that milk that has been heated to 145° F. for 30 minutes has lost more of its antiscorbutic potency than milk that has been raised to 212° F. for a few minutes. It is further believed that some of the contradictory observations connecting milk with infantile scurvy may be explained, in part, by the variable amount of this vitamin in milk depending upon the feed of the cows, and again upon the variable effect of heat, depending not so much upon the temperature, nor the time of heating, but especially upon the chances of oxidation during the process of heating. We now know that dry milk may retain its antiscorbutic virtue in spite of drying, canning and ageing, especially if well packed and hermetically sealed. It loses its potency after it is exposed to the air. Sweetened condensed milk which Hess found to contain antiscorbutic vitamin, "is zealously protected from access of air in the course of its manufacture." Alonzo Taylor also adds evidence to the fact that the antiscorbutic vitamin in canned milks is not necessarily destroyed, from the fact that in the war zone this milk prevented, and even cured scurvy. It was found that it takes about eight ounces of condensed milk, which is the equivalent of 20 ounces of milk, per day, to cure infantile scurvy.

Canned milks and dried milks, then, retain the fat-soluble A and water-soluble B vitamins in almost their original potency. The only vitamin in these preparations that may be affected is the antiscorbutic vitamin. The amount of this in canned milk will vary with many factors, primarily, the amount in the original milk, and, secondarily, upon the process of heating and evaporation, with special reference to oxidation.

REFERENCES.

1 Jour. Biol. Chem., July, 1920, 42, 383.
2 Jour. Biol. Chem., 1920, 45, 229.
3 Lancet, 1918, ii, 482.

# A REVIEW OF THREE HUNDRED CASES OF BLOOD CHEMISTRY.

By Edward B. Bigelow, M.D., Worcester, Mass.

This is the report of a review of the consecutive, chemical examinations of blood from the laboratory of the Worcester City Hospital during a period of eleven months. These specimens of blood were obtained from three hundred adult patients and include the examinations of 458 different specimens. The patients were nearly all hospital cases and seriously sick at the time of examination. The tests were not made routinely by any means upon every admission, but upon selected cases only, whose clinical condition at the time of the examination suggested the possibility of findings that would be of assistance in diagnosis, prognosis or treatment. Oftentimes the negative findings were of as much assistance as the definitely positive results. The blood chemistry report was the most important single factor of our investigation in some cases, but in a considerable majority of the three hundred, it was of minor interest; not to be ranked with the routine history, physical or urine examinations, but rather to be included in the class of the Wassermann reaction, the phthalein and Schlayer nephritic tests, which give assistance in the more complete consideration of a patient's condition.

An estimation of the blood sugar, urea nitrogen and creatinine was made in each case. In addition one hundred and fifty-six cases had an alkali reserve and twenty-nine an uric acid determination. The sugar, urea nitrogen, creatinine and uric acid were determined by the method of Folin and Wu,[1] and the alkali reserve by the titration method of Van Slyke, Stillman and Cullen.[2]

The blood specimens were obtained before breakfast after a fourteen-hour fast. Powdered potassium oxalate was employed to prevent clotting. Normal blood values for sugar are .09 to .12 of one per cent, for urea nitrogen 14 to 17 mg., for creatinine 1 to 2 mg., for uric acid 1 to 3 mg. per 100 c.c. of blood; and 80 to 53 c.c. for alkali reserve expressed as the $CO_2$ combining power per 100 c.c. of plasma. One hundred and seven patients had one or more constituents that were pathological in amount.

### CREATININE.

The most striking group with positive findings was that of eighteen cases that had a creatinine content of 2.5 mg. or more per 100 c.c. of blood. The creatinine of the blood is increased only in certain severe nephritic conditions. It is almost altogether of endogenous origin and therefore cannot be appreciably lessened by a low protein diet. Rarely does recovery take place after this constituent has once been retained in large amounts. Death is nearly always but a matter of days or weeks. This has been demonstrated by Meyers in a report of eighty-five cases with a creatinine value of 5 mg. or more, all of whom died except four.[3]

These eigheen cases are summarized in the accompanying table. All except one of them died within a short time. Number 17 is alive now, more than a year after these blood findings, but has, and still continues to require institutional care. These cases from a clinical point of view were recognized in each instance as seriously sick. However, among these three hundred cases, there were several other cases of nephritis that were apparently as sick as this group of patients at the time of their blood examinations, but without any increase in the retention of creatinine and with ensuing improvement. Therefore, the recognition of high creatinine values is of much importance from a prognostic standpoint. It is of interest to note in addition that three of these cases had no casts in the urinary sediment, one had no albumin, and in three the specific gravity was above 1.014, emphasizing the fact that at times negative urinary findings may be misleading in some cases of severe nephritis.

### UREA NITROGEN.

Although the normal value of urea nitrogen is from 13-17 mg. per 100 c.c. of blood, anything below 25 mg. in this hospital series I have found to be of small clinical import and have not included as among the cases with pathological findings. Urea nitrogen is largely of exogenous origin, in contradistinction to the endogenous origin of creatinine, and an increase of retention up to 25 mg. can generally be overcome, at least to a degree by dietary restrictions. In the table, all of the cases of high creatinine values were accompanied by high retention values of urea nitrogen. As can be noted in the table, there is no parallelism between the values for urea and creatinine, from the determination of one of these constituents the other cannot be estimated with any accuracy.

TABLE.

| Case | Age | Sex | Creatinine Mg. per 100 c.c. Blood | Urea Nitrogen Mg. per 100 c.c. Blood | Blood Sugar per Cent. | CO₂ Combining Power c.c. per 100 | Phthalein 2 Hrs. per Cent. | Blood Pressure | Days Before Death |
|---|---|---|---|---|---|---|---|---|---|
| 5 J. Z. | 29 | M | 24 | 214 | 0.15 | 29 | Less than 10 | 165/115 | 7 |
| 8 C. H. T. | 40 | M | 6 | 86 | 0.14 | | Less than 10 | 218/152 | 23 |
| 12 M. R. | 36 | F | 5.6 | 219 | 0.12 | | | 200/160 | 12 |
| 17 M. F. | 28 | F | 2.6 | 35 | 0.09 | 39 | 18 | 160/110 | Still living |
| 34 C. W. | 67 | M | 10.8 | 118 | 0.13 | | | 200/110 | 1 |
| 54 G. H. | 54 | M | 6.3 | 150 | 0.13 | 44 | 5 | 220/118 | 49 |
| 61 C. S. | 48 | M | 5 | 75 | 0.20 | 24 | Trace | 190/105 | 103 |
| 63 A. C. | 73 | M | 3.1 | 66 | 0.16 | 53 | | 160/94 | 12 |
| 67 M. L. | 47 | M | 3.2 | 75 | 0.14 | | | 98/64 | 2 |
| 92 P. T. | 51 | M | 3 | 60 | 0.10 | | 0 | 230/144 | 9 |
| 99 J. J. | 50 | M | 5 | 120 | 0.17 | | | 220/160 | 3 |
| 108 M. O. | 52 | M | 15 | 150 | 0.16 | 26 | Trace | 162/100 | 35 |
| 138 J. P. R. | 64 | M. | 3.7 | 60 | 0.20 | | 0 | 225/140 | 25 |
| 170 E. L. | 40 | M | 2.5 | 100 | 0.22 | 42 | | 112/64 | 2 |
| 183 J. C. | 56 | M | 7.5 | 150 | 0.16 | 65 | | 218/100 | 1 |
| 226 W. B. | 64 | M | 5 | 100 | 0.12 | 38 | 0 | 140/78 | 19 |
| 241 McK. | 25 | M | 5 | 150 | 0.13 | 27 | | 132/80 | 7 |
| 277 A. N. N. | 36 | F | 6 | 75 | 0.14 | 22 | | | 2 |

Besides these eighteen cases of high urea values there were thirty-five others among the three hundred that had from 25 to 60 mg. of urea and a retention of creatinine that was less than 2.5 mg. Of these thirty-five additional cases, fifteen died within a few weeks and most of the remainder were clinically seriously sick with chronic organic ailments, among which nephritis was the primary condition or a serious complication.

### NEPHRITIS.

Although in this series there was a large proportion of cases of chronic nephritis, several of them with acute exacerbations, there was only one case of acute nephritis, so-called, with general oedema and albumin, blood and casts in the urine with no apparent etiology other than exposure to cold. The only change in the blood values was an urea nitrogen of 30 mg. There was a marked subsidence of symptoms in the next ten days and with it the urea nitrogen sank to 16 mg.

While discussing the cases of nephritis with positive blood chemistry findings, several other cases in the series with normal values are noteworthy. Two cases, one followed for twelve years and the other for six with very large traces of albumin at each of many examinations, have continued to work during the time and have no blood nitrogen retention, a good phthalein excretion and response to the Schlayer two-hour test. The same findings were present in three other cases, who have been under observation a shorter length of time. The blood chemistry in these cases was a functional test of value, taken in conjunction with other renal function tests and assisted to a truer insight into the condition of these patients, demonstrating that, although the kidneys were at fault in the particular of a large, persistent albuminuria, in several other particulars they were capable of normal excretion.

Another case of apparently severe chronic nephritis, who entered the hospital with general anasarca of three months' standing, a large trace of albumin and many casts in the urine, was discharged much improved after remaining seven weeks. At the height of his symptoms he had no nitrogen retention in the blood and his phthalein excretion was 44% in two hours, but the kidneys were unable to excrete salt in appreciable amounts by the Schlayer two-hour test diet even after the disappearance of the oedema. Demonstrating again that examinations for nitrogen retention in the blood, phthalein and salt excretion are necessary in certain cases to determine what particular function of the kidney is at fault.

Among the patients in this series brought into the hospital in an unconscious condition, two were of especial interest, because they had a history of sudden onset and were having repeated convulsions, apparently the picture of the symptom complex commonly attributed to acute uremia. Neither had any blood urea ni trogen or creatinine retention and both made rapid symptomatic recoveries from their acute attack, although subsequent urine examinations proved them to be cases of chronic nephritis with good renal functions. In four other cases with convulsions and high urea and creatinine retention values, death ensued soon after the onset of the convulsions. Seemingly, the lack of a nitrogen retention in the blood of cases of uremia may be considered a portent of good omen in prognosis.

### URIC ACID.

No conclusions can be drawn from a review of the blood uric acid determinations in the twenty-nine cases. There was but one case of gout in the series. In this case, upon the first determination, when there had been no acute gouty attacks for months, and upon the second determination some nine months later, and as it happened preceding another acute attack by five days, the uric acid was somewhat increased, being 3.8 mg. per 100 c.c. on each occasion. It must be added that this case of typical gout was also one of hypertension with a systolic blood pressure of 190 and a diastolic of 120, no albumin, a few casts, and a phthalein excretion of 35% in two hours. These findings of an increase of the uric acid are compatible also with those of an interstitial nephritis as well. As pointed out by Meyers, Fine and Lough,[4] uric acid may be increased in interstitial nephritis before there is any retention of urea or creatinine and its quantitive determination may be employed as an early diagnostic sign of the condition.

### MYOCARDITIS.

There were twenty-nine cases with no arterial hypertension and with no nitrogen retention in the blood, in whom the primary diagnosis was myocarditis, which was severe enough to necessitate hospital and bed treatment. At entrance, in several of these cases with markedly incompetent hearts, the phthalein excretion was so low, that had that been the only test employed to judge of the ability of the kidneys in excreting deleterious products, their competency also would have been considered extremely poor. The low percentage of phthalein excretion was due to secondary passive congestion of the kidneys, and with improvement in the cardiac condition this percentage was much increased. In one case of auricular fibrillation with dyspnoea, anginal pain and vomiting, but no oedema, the phthalein excretion in two hours was less than five per cent., at the same time, there was no nitrogen retention at all, though the percentage of blood sugar was 0.14. In a short time she was symptomatically much improved and in ten days the two-hour phthalein was 35%. So that, though the blood chemistry examination was negative in these cases, in certain of them it was an index of kidney function, that was of more value in prognosis than the phthalein excretion.

### ACIDOSIS.

Acidosis is a condition in which the normal alkalinity of the blood is lowered. The blood actually never becomes acid. This diminution in alkalinity is brought about, as in diabetes, by an increased formation of acid bodies or, as in some cases of nephritis, by a lack of elimination of certain waste products. As previously stated, the normal combining power of the blood for carbon dioxide is from 80 to 53 c.c. per 100 c.c. of plasma. When the range is from 53 to 40 there is a moderate acidosis, no pronounced symptoms; below forty a severe acidosis, a dangerous lowering of the alkali reserve.

Frequent determinations of the alkali reserve of the blood are of importance in the treatment of diabetes mellitus during the stage of decrease in the diet and the determination of the carbohydrate tolerance. It is a much more satisfactory and precise test than the presence or absence of acetone and diacetic acid in the urine. These bodies may be present in the urine and the alkali reserve of the blood show no acidosis. In this series, with this test as an index of the absence of a severe acidosis, the diabetic cases were treated with more assurance and the decrease of diet persisted in, even though there was a marked acetonuria.

Chace and Myers[5] have demonstrated that fatal cases of chronic nephritis with marked nitrogen retention show a severe acidosis. By reference again to the table this is seen to be the experience in this series. The exceptions, that is values above forty, were in cases receiving soda bicarbonate medication at the time of the blood examination

In this series of 159 cases, in which the alkali reserve was determined, in only seven others than in the table was it 40 or below. One case of nephritis with an alkali reserve of 35 and without nitrogen retention died in three weeks after the determination; a second case with a value of 31 was in a pregnant woman with lethargic encephalitis, who also died in three weeks; a third with 27, a patient already mentioned in the review, was a case of uremia in convulsions, unconscious and without nitrogen retention and made a good recovery. The four remaining cases each had an alkali reserve of forty. One man convalescing from pneumonia (after treatment) had a normal reading in a few days; a woman, with pernicious vomiting of pregnancy, made a good recovery; the other two were cases of diabetes undergoing the Joslin treatment at the time, who were quickly relieved of the condition without the administration of alkalies, when the condition was recognized by the routine blood examination.

### PREGNANCY.

Seventeen cases of pregnancy are included in the series. In the four normal cases the blood findings were within normal limits with the exception of the urea nitrogen, which was low in each instance, a fact that has been pointed out by Folin.[6] One case of placenta previa had a urea nitrogen content of 33 mg. per 100 c.c. and went on to a normal convalescence. The case of encephalitis lethagica of fatal outcome without retention of sugar or nitrogen, but with an alkali reserve of only 31, has been noted previously. One case of hydramnios had normal blood values.

There were ten cases of toxemia of pregnancy of the pernicious vomiting type. A series of extremely sick patients. The blood examinations gave figures within normal limits, except that one case at one time had an alkali reserve of 40 and a blood sugar percentage of 0.17. Tileston and Comfort[7] report normal figures for urea nitrogen in these cases. A high ammonia nitrogen coefficient in the urine was found to be a more dependable, positive index of the severity of the condition as has been previously demonstrated by Losee and Van Slyke.[8]

### MISCELLANEOUS CASES.

There were three cases of brain tumor, two as proven by operation and one by post-mortem examination. The chemical examinations were negative, except that in the case that died and in whom small, red kidneys were found at autopsy, the last blood test two days before death showed a sugar percentage of 0.16. One case had an intermittent glycosuria and a normal blood sugar value.

There were eight cases in whom the final diagnosis was bronchial asthma. The blood examinations were made during the clinical workup. The values were normal in all.

Of eight cases of hypertrophied prostate, in only one was there any abnormality in the blood examinations, a urea nitrogen value of 30 mg. per 100 c.c. No radical treatment was caried out and the patient was discharged with an amelioration of symptoms. There were also four cases of septic infection of the bladder or kidneys. One had a urea nitrogen of 32 mg. and died within a short time.

Fifty-six cases had a blood pressure of at least 165 m.m. Hg. systolic or 110 diastolic, besides those listed in the table. Eight of these cases died within a short time after coming under observation. Of these fifty-six cases, with the exception of two with abnormally high urea values, none had more than a miner degree of nephritis. The blood chemistry was one of the functional tests employed in attempting to differentiate these cases as either primary hypertension, or hypertension with myocardial complications from those that had a nephritis in addition.

Of malignant disease there were nine cases that had progressed to cachexia when the blood was examined. In only one was the blood sugar above .11 of one per cent. and then the value was .18. Four had urea nitrogen figures of from 25 to 42 mg. per 100 c.c.

Among six cases of severe anemia, five of them of the pernicious type, the blood findings were normal with the exception of one with 25 mg. of urea nitrogen. One case of Hodgkin's disease had normal figures.

There were four cases of cerebral infection, who were unconscious at the time the blood examinations were made. Two of them proved to be tubercular meningitis and two lethargic encephalitis. Three had urea nitrogen values of 25 mg. or more and three had a hyperglycemia

Five cases of severe furunculosis without glycosuria had normal blood chemistry findings. These tests were performed with the idea that possibly a hyperglycemia might be discovered indicating a prediabetic state, which anticipated, might under appropriate treatment, clear up the furunculosis and avoid severe manifestations of the disease.

### DIABETES.

In no group of cases among the three hundred were the blood chemistry determinations of more value than in the twenty-five of diabetes mellitus. It is now generally recognized that in the treatment of this disease it is fully as important to moderate the hyperglycemia as to clear up the glycosuria. Freedom from glycosuria is no longer the goal in treatment. Repeated determinations of blood sugar are therefore necessary as guides to obtain the best result in treatment.

Before instituting treatment in these cases an initial blood chemistry examination, including a determination of the alkali reserve, was an important index of the degree of severity of the individual case. Frequent blood analyses were in order, to check up the degree of acidosis and the level of the blood sugar, while the Allen-Joslin treatment was being carried out to clear up the glycosuria, then during the determination of the tolerance for food and later in attempting to moderate the hyperglycemia.

Three cases of diabetes, who had their food tolerance determined and kept within their limits of diet, immediately, upon the onset of influenza, lost their tolerance altogether and again developed a glycosuria, which persisted during the febrile state and for a few days afterward.

One case with a marked family history of diabetes mellitus was found to have a slight persistent hyperglycemia without glycosuria at any time. Upon the application of the blood sugar tolerance test, as described by Janney and Isaacson,[9] at the end of the first hour the glycemia was .21 of one per cent. and a trace of sugar in the urine, at the end of the second hour it was .12 and still lower at the end of the third and fourth hours without any more glycosuria. After following advice as to a more moderate diet, the blood sugar level diminished and the development of diabetes perhaps has been averted or postponed.

None of the cases in this series came within the classification of renal diabetes. However, However, five of them had a glycosuria without a hyperglycemia. This glycosuria in all of them cleared up within a few days without dietary restrictions.

### HYPERGLYCEMIA.

Besides the diabetic cases, there were fifty-two others in the series that had an hyperglycemia of .13 of one per cent. or more. Many cases of severe nephritis have high figures for blood sugar as well as for nitrogen. The table demonstrates this, for among those eighteen cases of nephritis with high urea nitrogen and creatinine values, fourteen also have a high value for sugar. Of the remaining thirty-eight cases with a hyperglycemia, twenty-three are cardio-renals, which bears out the statement of Williams and Humphreys,[10] that high blood sugar levels are associated with severe phases of this condition.

### CONCLUSIONS.

From a review of the blood chemistry in this series of three hundred patients, it is to be concluded, that in general, these examinations, whether they prove to be normal or abnormal, are functional tests of value in the fuller consideration of cases. Prognosis is extremely poor when there is a high retention of creatinine, and rather poor when a high urea retention. The determination of the alkali reserve is valuable in diabetes mellitus and to a lesser degree in nephritis. Repeated blood sugar determinations are invaluable as guides in the treatment of diabetes mellitus.

### REFERENCES.

[1] Folin and Wu: Jour. Biol. Chem., Vol. xxxiii, p. 81, May, 1919.
[2] Van Slyke, Stillman and Cullen: Jour. Biol. Chem., Vol. xxxiii, p. 167, May, 1919.
[3] Myers: Jour. Lab. and Clin. Med., Vol. v, p. 566, June, 1920.
[4] Myers, Fine, and Lough: Arch. Int. Med., Vol. xvii, p. 570, 1916.
[5] Chace and Myers: Jour. A. M. A., Vol. lxxiv. p. 641, March 6, 1920.
[6] Folin: Jour. A. M. A., Vol. lxix, p. 1212, Oct. 13, 1917.
[7] Tileston and Comfort: Arch. Int. Med., Vol. xiv, p. 620, 1914.
[8] Losee and Van Slyke: Am. Jour. Med. Sci., Vol. cliii, p. 94, 1917.
[9] Janney and Isaacson: Jour. A. M. A., Vol. xx, p. 1131, April 20, 1918.
[10] Williams and Humphreys: Arch. Int. Med., Vol. xxiii, pp. 537 546, 559, 1919.

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# THE NEED OF HEALTH CENTRES.*

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From time to time, various and sundry amateur and professional uplifters have endeavored to prescribe for the political, industrial and bodily ills of mankind, and not infrequently their prescriptions are based either upon an inaccurate and incomplete investigation of all the facts in the case, with a resulting inaccurate diagnosis of the underlying pathological condition, or upon an incomplete appreciation of the collateral effects upon not only those whom they wish to assist, but also upon those whom they wish to assist them. In endeavoring to arrive at a proper conclusion as to the desirability of any proposition for the betterment of mankind, it is absolutely necessary to very carefully consider and weigh all the facts in the case, their relation to each other and to the surrounding elements of society: the nature and variety of the employment, the income, the mode of living, sanitation, environment, cost of food and clothing, medical attendance, drugs and medicines, the amount spent for these and other luxuries, for extravagances, for dissipations—mild, such as the movies, or more serious, as for alcoholics, for irregularities, such as gambling or immoralities. Until such a complete survey has been made, it will be utterly impossible to determine absolutely the need of the proposed measure. In making such a survey, it is imperative that the surveyors shall be thoroughly competent for the purpose—that they shall be those with the inclination, training, and capability for the work, and not, as was the case a few years ago, when it was proposed to utilize fourth-year high school students in making a sanitary survey of the West Side. In medical matters, it is necessary that the surveyor shall be a broad-minded, ripened, and experienced physician, in order that he may be capable of determining and weighing all the facts and of ascertaining whether or not the person is really in need of medical care and whether he will accept it, or whether he prefers to depend on home-treatment, quack medicines, "new thought," or on "Christian Science." In promoting the propaganda for health centres, these conditions do not seem to have been fulfilled. Moreover, the propagandists seem not to have been able to appreciate the fact that prevention is better than the cure; that their Utopian schemes are not calculated to prevent the incidence of diseases which they want to relieve after they have already occurred. The sun, as he goes his daily rounds, does not look down upon a race which has not been sorely tried by impractical experiments to uplift and reform. From the beginning of time, all men have had a willingness, if not an ambition, to help the poor and needy. But they usually prefer to help someone at a distance—like sending red flannel shirts to the Hottentots in Africa—and not to help those nearby; to attend to some other work, and not to the work for which they were constituted and created. But the poor have not been helped; on the contrary, we are all being constantly and needlessly oppressed. Millions willing to work and care for themselves, have been impoverished and pauperized, cruelly, needlessly, and wickedly, by those who have pretended, and sometimes honestly, to want to help them.

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The researches of your committee have shown that while the number of physicians in the rural districts is less than formerly, this change is due to the rural physicians moving to the cities and towns, because there they can more easily earn a reasonable living without such an immense expenditure of energy and vitality; and because there are fewer recent graduates going to the rural districts. These results are due to the more strenuous life of the medical practitioner in the rural districts; the question of fees and collections; and to the fact that the true physician goes to see a sick person, whether he can pay or not. The lessened number is also due to the law of supply and demand, and whether the person demanding is willing to pay a reasonable price for the supply. The spreading abroad of the fact of the lessened number of physicians in the rural districts, is due to the desire of the amateur and professional uplifters to arouse the enthusiasm and support of these who have been deemed to be "amiable weaklings in business matters, easily gulled by piteous tales and flattering remarks about the magnanimity of the profession," and thus to inveigle them into supporting an impracticable and dangerous scheme. The general medical practitioner is the most altruistic person on the face of the earth—he is constantly striving to get and to keep his patients well and thus to lessen his own income. This is after he has entered into the practice of his profession, but the average man is by nature concerned, primarily and chiefly, in those things which pertain to his own personal advantage. Almost no one, except the theological student, goes into a profession purely and solely 'for the glory of God and the benefit of mankind," and if the obstacles to the successful practice of medicine are increased by such schemes as compulsory health insurance, health centres, and state medicine, the number and quality of the men who will choose the medical profession will be materially reduced, and when that happens, the whole people will suffer from their inefficiency.

In the reports received in response to our circular letter, your committee has found that on the average there are two and one-half hospitals in each county, and that these have the confidence and support of the people; that the people in the rural districts get to their physicians more easily, and the physicians to their patients more easily, except when confronted by the deep snows of winter, on account of the use of automobiles and the "state roads" through the state. The majority of cases do not need the so-called advantages of "group medicine," nor of hospital treatment. All they need is a good, clean, well-lighted and well-ventilated room, good medical attention, and someone who is gentle, kind, neat, and fairly intelligent, to take care of and to wait on them. All of these can be as well obtained in the rural districts as in the most aristocratic city hospital, where the expense per capita of keeping the patients is higher than it would be in the highest priced hotel in New York City. Moreover, even if it were necessary to have all the highly qualified specialists specified in the propaganda for health centres, where would they be able to get real and not pseudo-specialists? Would they be made over night, as it is reported some of the specialists in this city are? Again, would the specialists agree on the diagnosis and treatment? If not, what sort of a predicament would the poor man be in? Suppose the ophthalmologist insisted that he had oculomotor imbalance and must have his muscles cut; the rhinologist, that he must have his tonsils, adenoids and turbinates removed and his ethmoids curetted; the dentist, that he should have all his teeth extracted; the otologist, that he should have a mastoid resection; the gastro-enterologist, that he should have the "cobwebs in the attic" removed; the abdominal surgeon, that he should have a gall-bladder resection and his appendix taken out; the urologist, that he should have an operation on his prostate and his "calibre" dilated; the proctologist, that he should have his hemorrhoids removed and perhaps the lower end of the intestine resected. "What would the poor man do then?" Fortunately, he is not a woman, for if the gynecologist got hold of him, the Lord only knows what the end would be. "Group medicine is not all it is cracked up to be." One of our most honored members, recently deceased, told me of a patient who came to his office, after having been to one of the highest priced diagnostic clinics and where she "took the whole course," and informed him that they told her that "her condition was due to some, as yet, unidentified germ circulating in her blood."

The business of government is not to make men or to cure them, but to give them a free chance to make themselves, and to choose their own method of being treated when sick. That was the spirit on which this government was founded. That was the practice which developed the American pioneer and which distinguishes him from the European peasant. Individualism develops a breed of strong, self-reliant, free men. Socialism is simply a crutch for the half-free, half-dependent, or wholly dependent. The demand for it in America has grown in direct proportion as the number of unassimilated aliens has increased. Educated and coerced into the belief of the super-state, always subservient to someone, always dependent upon someone, they conceive government to be omnipotent for good or for evil, and so they are easily led by agitators and demagogues in and out of office, who are always seeking to increase their power,—and their income.

The highest degree of civilization is not indicated by the city having the greatest number of hospitals, almshouses, and insane asylums; not the one having the most, but the one having the least need of them.

The State Department of Health was constituted for the following purposes: To supervise the sanitary engineering of the State; to investigate the causes of diseases; to prevent the spread of contagious and infectious diseases; to collect vital statistics; to educate the public in matters pertaining to health; to supervise child hygiene; to supervise public nursing; to supervise the tuberculous.

Therefore, its purposes being prevention, it can best accomplish the purposes of its creation by performing and adhering to these duties. The most injurious influences affecting the physical condition of young children arise from the habits, customs, and practices of the people themselves, rather than upon external surroundings or conditions. The environment of the infant is its mother. Its health and physical fitness are dependent primarily upon her health, her capacity for domesticity, and her knowledge of infant care and management. The causes of infant mortality are: Defective sanitation, bad housing, overcrowding, insufficient nutrition of the mother, want of lactation, improper feeding, maternal ignorance of what is proper care, and the hereditary result of vice; but the principal operating influence is the ignorance of the mother, and the remedy is the teaching of the mother. These duties properly belong to the Department of Health and if thoroughly and properly attended to will leave much less to do in the way of curing disease after these same children have grown up and have become adults.

Of late years there has been too great a tendency to "put it up to the government" and too little to the person himself—the socialization of everything. Every attempt at nationalization, including our own during the world-war, has resulted in inefficiency and decreased production. Have not our own personal experiences proved this? Have we forgotten the government control and operation of railroads, telegraphs and telephones? Is it not only recently that the telephone service has approximated in efficiency the standard set before the war? If we are to have governmental or state control, where are we to stop? Inasmuch as more than half the ills of mankind are due to his eating, shall we have government control and operation of all the eating places? Shall we have institutions telling us where to eat, what to eat, when to eat, how much to eat, and how to have it cooked? Shall we have public restaurants providing food without cost to all, whether they can pay for it or not? Shall we have the same condition regarding our clothing so that we shall be ordered what to wear and when we shall wear it? Will the clothes be furnished free? Do you think it will make women's dresses any lower at the bottom or any higher at the top? Shall we have our games, entertainments, and outings supervised and regulated by some supervising agency which thinks it can best apportion them to our needs? Finally, shall we have our ideas and religion supervised and regulated by public agencies? Where, then, will be the freedom of our country, of which we are so proud? Is it not about time to call a halt to all these socialistic schemes? Is not the greatest efficiency through self-interest? Are not these simply the desires of someone to "put over" schemes for "fat jobs," or are they merely the maundering expression of the weak and incompetents to directly or indirectly get something for nothing?

"What is a Socialist? One who has yearnings
For an equal division of unequal earnings;
Idler, bungler, or both, he is willing
To chuck in his kopek and gobble your shilling."

The State Department of Health has been holding itinerant health clinics in various parts of the state, and the newspaper report of the one held at Goshen, states: "In the majority of cases, the diagnoses of the local physicians were confirmed." (New York Times, Sept. 12, 1920). That being the case, what was the need of these "health clinics"? I wish, most emphatically, to register my protest against the idea that the country physicians are the ignoramuses which so many of the city residents are so fond of assuming. On the contrary, they are at least equal to, if not more competent than the average city physician. They may not know so much about any one specialty, but they have some knowledge of all the specialties and are better grounded in all-round medical practice. Being compelled to depend upon themselves, they have acquired a better understanding of the diseases that occur in their locality and how to treat them. Robert Koch, the discoverer of the tubercle bacillus, was an obscure country physician; and I am creditably informed that the "Mayo Brothers," referred to in the State Department of Health's propaganda letter, were never even hospital internes, but they settled in a small country town and have been the cause of its growth, on account of their success and fame. Moreover, this was done without any subsidized "health centres," and was due entirely to the skill and genius of these same country practitioners.

In conclusion, there is no need of "health centres" as outlined in the bill recently introduced into the New York State Legislature: but there is a great and crying need for further means of educating the public in the care and feeding of children, and in all matters pertaining to sanitation and prevention of disease.

Malden has three mild cases of smallpox. These cases, following the case in Boston, indicate the necessity of care in explaning the importance of vaccination to careless or indifferent people.

## Clinical Department.

### A POSSIBLE CASE OF NEPHRITIS IN A CHILD WITH EDEMA AND WITHOUT ALBUMINURIA.

By John Lovett Morse, A.M., M.D., Boston.

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Elizabeth B., who had previously been well, began to be peevish and to want to be held, about September 10. These symptoms continued, and September 22 her eyelids became swollen and her face pale. A few days later her abdomen began to enlarge and on October 7 her legs began to swell. She vomited once in three or four days and had several loose stools daily. There had been no urinary symptoms. She was admitted to the Children's Hospital October 11, when two years and nine months old. She had had a cold in her head for about three weeks.

Her face was markedly swollen, the eyelids being so large that she could hardly open her eyes. She showed the evidences of nasopharyngitis. The heart and lungs were normal. There was no enlargement of the liver or spleen. The level of the abdomen was that of the chest. There was a dullness in both flanks, which did not shift. There was slight edema over the tibiae.

Blood: Hemoglobin, 65% (Sahli); white corpuscles, 10,000; small mononuclears, 52%; large mononuclears, 4%; polynuclear neutrophiles, 41%; eosinphiles, 3%. The red blood cells were normal in size, shape and color. The blood platelets were apparently normal. Blood Pressure—systolic, 70; diastolic, 50. Stools—Normal, macroscopically and microscopically; Tuberculin Test — Negative. Urine — Straw-color; faintly acid; 1008; no albumin, sugar or acetone. The sediment showed many epithelial cells, a few white cells and a rare red cell, but no casts. The urine was examined daily during her stay in the hospital and at no time contained any albumin. No red cells were seen after the first examination and there were never any casts. The specific gravity varied between 1005 and 1020.

She was put on a salt-free diet and the proteins limited to 25 grams daily. Fluids were limited and the bowels were moved freely with Epsom salts. All evidences of edema were gone in three days, while her weight dropped in five days from 26¼ pounds to 22 pounds. The amount of urine varied directly with the fluid intake.

The diagnosis of idiopathic edema was made and not much attention was given to the case until her brother was admitted about a month later with similar manifestations. The presence of such an unusual picture in two children in the same family made it seem worth while to study him more carefully.

Robert B. entered the Children's Hospital November 3, when he was 5½ years old. His parents and four other children, besides Elizabeth, were well. There had been no deaths or miscarriages and no history of disease of the kidneys in the family.

He was born at full term after a normal labor. He was breast fed for a year and then given a general diet. He had always been well except for influenza a year before.

His mother noticed, October 25, that his abdomen was swelling. He had complained of no pain and was well enough to be up and about. A few days later he complained of being tired and went to bed. The abdomen increased steadily in size, and November 2 his face and legs began to swell. He also began to complain of intermittent pain in the abdomen. It did not radiate downwards and there were no urinary symptoms. There was no headache or vomiting, but he was somewhat feverish. His bowels became loose about twenty-four hours before he entered the hospital. The amount of urine also diminished at this time.

He was well developed and nourished. The whole face was moderately swollen and the cheeks flushed. There was edema of both the upper and lower eyelids. His tongue was coated. The tonsils were a little large. The teeth were good. D'Espine's sign was present through the fourth dorsal spine. The right border of the cardiac dullness was 2½ cm. to the right and the left border 6½ cm. to the left of the median line. The heart sounds were normal, except for a slight systolic murmur in the pulmonic area, which was undoubtedly functional. The lungs were normal. The level of the abdomen was higher than that of the thorax. There was slight general tenderness, but no rigidity. There was dullness in the flanks, but no shifting dullness. There was no enlargement of the liver or spleen. The kidneys were not palpable, but there was marked tenderness in both costovertebral angles. There was some edema of the lower back, considerable edema of the scrotum and marked edema of the whole of both legs. The rectal examination showed nothing abnormal. There were a few small glands in the neck. His temperature was 100.4° F. It dropped to normal the next morning and never rose again.

Blood—Hemoglobin, 50% (Sahli); red corpuscles, 4,200,000; white corpuscles, 7,500; small mononuclears, 44%; large mononuclears, 2%; transitionals, 1%; polynuclear neutrophiles, 48%; eosinphiles, 5%. The red cells showed slight variation in size and color, but were normal in shape. The blood platelets were normal in number. The tuberculin test was negative. The urine at entrance was cloudy, amber in color, acid in reaction and showed a specific gravity of 1014. It contained no albumin, sugar or acetone. There were three millimeters of sediment in the tube after centrifugalization. The sediment contained mucus, a few squamous, epithelial and white cells, but no red cells. An occasional hyaline cast was seen. There were also some calcium oxalate and amorphous crystals seen. The urine the next day showed no casts.

He was put on a salt-free diet, the proteins were limited to 25 grams and his fluids to 10 ounces. He was given Epsom salts to move his bowels. He at first passed only five to ten ounces of urine daily, but the amount went up to 58 ounces on November 8 and from that time bore about the normal ratio to the fluid intake. All traces of edema were gone November 11, when he was up and about and apparently well. His weight at entrance was 39¼ pounds. It dropped to 33 pounds on November 9, where it remained for some time, gradually rising to 36 pounds at his discharge December 13. This rise, however, was not due to edema but to actual gain in flesh.

It seemed well worth while to attempt to determine the cause of the edema in these two children. The first one could not, of course, be studied, but the study of the boy was begun at once. Possible causes of edema at this age are heart disease, anemia, disease of the kidneys, malnutrition, toxemia, angioneurotic edema, perhaps as the result of anaphylaxis, lack of some of the accessory food factors, and salt retention from some cause.

His home was investigated. The parents and other children were perfectly well. The home conditions were not of the best, but there was a sufficient supply of fresh air and sun. The water supply was from the Metropolitan Water System through lead pipes. The Metropolitan water is above reproach. His urine was examined for lead and none found.

His diet was investigated and found to be sufficient in all the food elements. He had both milk and butter, with a sufficient amount of meat and fruit. There was no reason, therefore, to suspect any lack of any of the accessory food factors. The milk supply was Hood's ordinary pasteurized milk.

The mother stated that none of the children cared for salt, and that consequently she used very little of it in preparing their food. She was certain that he had never had an excess of salt. Edema from salt retention seems, therefore, very improbable.

It was found that both the boy and his sister had been eating a good many raw apples before the onset of the edema. After the edema had entirely disappeared, he was, therefore, given three raw apples to eat on two successive days. There was, however, no return of the edema, showing that the edema could not be due to sensitization to apples. This line of investigation was followed out with skin tests for anaphylaxis, and he was found negative to all the proteins which were tried. These were egg-white, egg-yolk, cow casein, beef, lamb, pork, chicken, salmon, herring, blue fish, cod, oysters, barley, wheat, spinach, walnuts, chicken feathers, cat hairs, dog hairs and horse dandruff. This list is, of course, quite incomplete, but it includes representatives of all the different classes of proteins. It seems probable, however, that if he was sensitive enough to show such a general edema, he would be sensitive to all members of any given class.

The normal condition of the heart showed that the edema could not be due to cardiac failure. While the hemoglobin was rather low, the blood did not show the evidences of a degree of anemia in any way sufficient to account for such a generalized edema.

There was nothing in his story to suggest that he was suffering from any marked disturbance of malnutrition, and, when he had lost his edema, it was evident that he was not badly nourished. The generalized edema could not, therefore, be due to simple malnutrition.

The normal temperature and the absence of any evident focus of infection seem sufficient to exclude toxemia as a cause of the edema.

It seems, therefore, as if the edema must have been due to some interference with the functioning of the kidneys, or, failing this, must be classified among the very indefinite group of the so-called "idiopathic edemas." The functioning of the kidneys was, therefore, carefully studied. As already stated, and as is shown by the accompanying chart, after the disappearance of the edema, the ratio between the intake and output of liquid was normal, showing that there was no interference with the excretion of water. The urine was examined daily during the month or more which he remained in the hospital. At no time did it contain any albumin and at no time were any red corpuscles seen. A few casts were seen at entrance and again on November 12, but at no other time. The specific gravity varied between 1008 and 1020.

Several phthalein tests were done, none of them, unfortunately, before the disappearance of the edema. The phthalein test November 11 showed: first hour, 20%, second hour, 10%; total, 30%. That done November 17 showed: first hour, 20%; second hour, 15%; total, 35%: That done December 6 showed: first hour, 30%; second hour, 20%; total, 50%; that is to say, there was considerable reduction in the phthalein excretion in the beginning, and even at the end it was somewhat below normal.

The gravity fixation test was done on two occasions. In this test two grains of caffein sodium benzoate and 15 grains of sodium chloride are given at each of three prescribed meals. Ten ounces of water are given at each meal and none between the meals.

The specific gravity of the urine is then tested at frequent intervals. The results of the tests were as follows: November 11:

November 11

| | | |
|---|---|---|
| 8.00 A.M. | 5 c.c. | 1012 |
| 10.00 A.M. | 23 c.c. | 1021 |
| 12.00 M. | 18 c.c. | 1021 |
| 2.00 P.M. | 22 c.c. | 1019 |
| 4.00 P.M. | 35 c.c. | 1020 |
| 6.00 P.M. | 67 c.c. | 1016 |

Unfortunately, the night urine was not preserved on this occasion. The variation in the specific gravity during the day, however, was not quite as great as would be expected under normal conditions. The gravity fixation test on November 19 showed:

| | | |
|---|---|---|
| 6.00 A.M. | 35 c.c. | 1015 |
| 8.00 A.M. | 30 c.c. | 1016 |
| 10.00 A.M. | 30 c.c. | 1010 |
| 12.00 M. | 17 c.c. | 1020 |
| 2.00 P.M. | 75 c.c. | 1017 |
| 4.00 P.M. | 75 c.c. | 1018 |
| 6.00 P.M. | 25 c.c. | 1015 |
| 6.00 A.M. | 330 c.c. | 1013 |

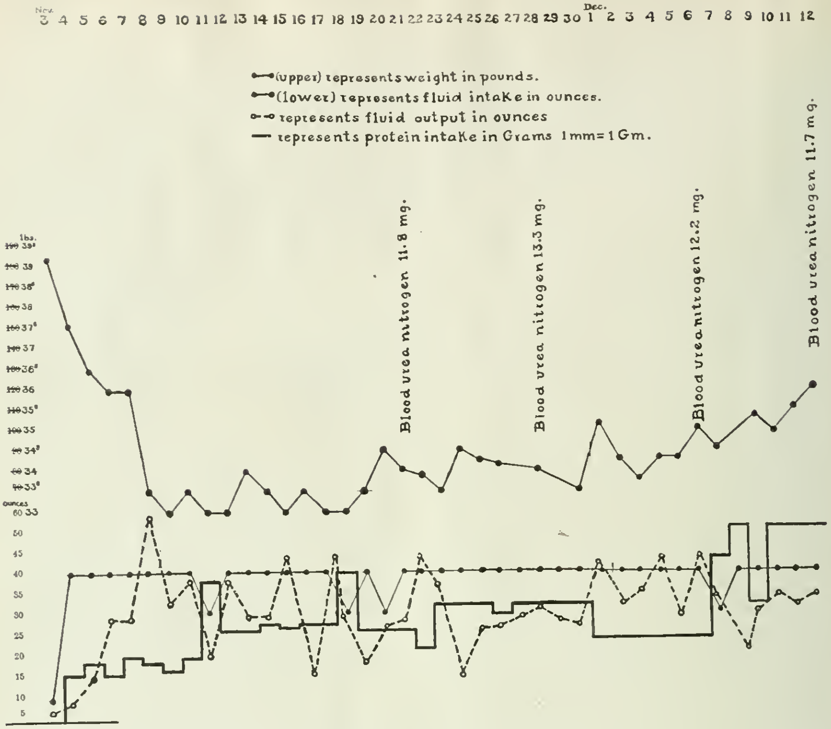
The variations in the specific gravity in this test are greater than at the first test, and show but little fixation of gravity. The results differ from the normal, however, in that the night urine was larger in amount than the day urine, and the specific gravity was lower in the night urine than during most of the day. Under normal conditions the amount of urine passed during the night is less than that passed during the day and the specific gravity is higher.

It was thought that something might be learned as to the function of the kidneys by examining the blood urea nitrogen while varying the amount of protein in the diet. The results are shown on the chart and in the following table:

| | |
|---|---|
| Nov. 11. | Protein increased from 30 to 35 grams daily. |
| Nov. 21. | Blood urea nitrogen, 11.8 milligrams. |
| Nov. 22. | Protein increased to 40 grams. |
| Nov. 28. | Blood urea nitrogen, 13.3 milligrams. |
| Dec. 1. | Protein diminished to 25 grams. |
| Dec. 6. | Blood urea nitrogen, 12.2 milligrams. |
| Dec. 8. | Protein increased to 60 grams. |
| Dec. 12. | Blood urea nitrogen, 11.7 milligrams. |

It is evident from this table that the blood urea nitrogen was always well below the normal limit and that there was, therefore, no nitrogen retention. The blood urea nitrogen did vary directly for a time with the amount of protein in the diet. At the end, however, when the protein given was at its maximum, the blood urea nitrogen was at the minimum.

It is evident from these investigations that there was some interference with the excretory functions of the kidneys. It is possible that there may have been more interference with them at that time when the edema was marked. The evidences of interference with the excretory functions of the kidneys are, however, so slight that they hardly seem sufficient to account for the symptoms. They are, moreover, rather inconsistent. It is, furthermore, very difficult to understand from them what pathological condition could have been present in the kidneys, when it is remembered that the urine at no time contained any albumin or red cells, and only on two occasions a few casts. In this connection, it must also be remembered that it is extremely common to find an occa



sional cast in the centrifugalized sediment of the urine of children, ill from any disease or even apparently well.

The blood pressure, tested November 19, showed that the systolic pressure was 78 and the diastolic 55, that is, below rather than above the average at this age. This finding is inconsistent with any marked disease of the kidneys.

The literature on nephritis in children contains various references to nephritis without albuminuria. The earliest report is probably that by Litten (*Charité Annalen.* 1882. *Jahrg.*, VII, 162), who found a severe hemorrhagic nephritis in an adult with marked edema, whose urine showed no albumin, but an occasional cast. Henoch (*Vorlesungen über Kinderkrankheiten,* 1895, p. 394), in discussing nephritis after scarlet fever, reports cases of acute hemorrhagic nephritis, proved by autopsy, in which the urine contained no albumin and only a few renal elements. He also reports cases, proved by autopsy, with edema and a normal amount of urine, but without albumin or renal elements in the urine. Cassel (*Berlin. klin. Woch.*, 1900, XXXVII, 213) reported nine cases of nephritis without albuminuria in babies from 7 weeks to 2½ years old. Two of them were shown by autopsy to have had parenchymatous nephritis, although no albumin or casts were found in the urine at any time. He reviews all the literature up to that time. He also believes that children can have edema without nephritis or other of the usual causes. Bellico (*Rivisti. di Clin. Pediat.*, 1905, No. 10) quoted by Dickinson (*British Jour. of Child. Dis.*, 1906, III, 163) and Parkinson (*British Jour. of Child. Dis.*, 1916, XIII, 138) have reported similar cases. Senator (Nothnagel's *Encyclopedia of Prac. Medicine,* 1905. Vol. on Diseases of the Kidney, pages 85-87)), in discussing edema in nephritis, mentions and criticises the various theories. He says that edema is much more common when the glomeruli are involved. This is because the capillaries of the glomeruli are involved by toxic substances in the blood before the other parts of the kidney, they being more easily affected. If it was simple interference with the excretion of water, edema would occur just as easily when the tubules are involved first, but this is not the case. Edema occurs only when the blood and lymph vessels of the skin are also involved by toxic substances in the circulation. The vessels in the skin and capillaries are more sensitive than the tubules. It is possible that the vessels of the skin may be involved before the capillaries of the glomeruli, or be the only ones involved.

If nephritis can occur without albuminuria and with no, or very few renal elements in the urine, and if nephritis of this type can be accompanied by edema, as is stated by the authorities just quoted, it is possible that the edema in these children may have been a manifestation of nephritis. The interference with the elimination of phthalein and the peculiarities shown in the gravity fixation test in the case of the boy, lend some probability to such a possibility. The absence of any other evident cause for the edema, in spite of careful search, is negative evidence in favor of this possibility. Senator's explanation of edema on the basis that toxic poisons may affect the vessels of the capillaries of the glomeruli and the skin before the tubules, thus without diminishing the amount of urine or causing albuminuria, seems more or less reasonable. Nevertheless, in this instance, at any rate, there being no other evidences of toxemia or any cause for it, it is rather hard to believe that there could have been a toxemia severe enough to injure the capillaries of the kidneys and skin, to the extent necessary to produce so much edema without causing a rise in temperature and other manifestations of toxemia. It does not seem justifiable, therefore, to make a positive diagnosis of nephritis with edema and without albuminuria in this instance, although such a diagnosis is certainly suggested. It is, perhaps, safer to class it under the unsatisfactory head of idiopathic edema.

* * *

Dr. Stephen Smith, first president of the A. P. H. A., now ninety-eight years old, will welcome members of the Association at the fiftieth annual meeting next November. Dr. Smith is described as young in physique and spirits.

## NEWS FROM DISTRICT SOCIETIES.

Hampden District Medical Society.—The annual metting of the Society was held at the Springfield Academy of Medicine, 137½ State Street, Springfield, on Tuesday, April 26, at 4 p.m.

Regular business and election of officers for the ensuing year.

Paper:—Right and Wrong Uses of Diuretics. —Dr. Henry A. Christian, Physician-in-Chief, Peter Bent Brigham Hospital, Boston.

Discussion. Luncheon at expense of Society.

The Censors meet for examination of candidates, on Thursday, May 5, at 4 p.m., at Springfield Academy of Medicine.

Worcester Medical Milk Commission.—At the annual meeting of the Medical Milk Commission of Worcester, Mr. Fred A. Walker, Esq., was elected president and Dr. Ray W. Greene, clerk. The executive committee consists of the president, clerk and Prof. Walter L. Jennings.

The Commission is now giving its approval to the milk from the Hampshire Hills Farm of Wilton, N. H., as "certified milk," and to the milk from the Sibley Farm in Spencer, Mass., as "inspected milk."

Memorial Hospital Staff Association.—The monthly clinical meeting of the Memorial Hospital Staff Association of Worcester was held at the Hospital, Friday evening, April 22, 1921.

The following papers were read: Double-headed Monsters, Dr. Winifred Grant; Intestinal Obstruction in Infants, Dr. Walter C. Seeley; Scoliosis, Dr. Charles E. Ayres; An Unusual Case of Nephritis and Acute Encephalitis During the Course of Chronic Nephritis, Dr. Oliver H. Stansfield.

Dr. E. H. Bigelow of Framingham has been elected president of the Middlesex South District Medical Society, for the ensuing year.

The April Meeting of the Brockton Medical Society was held April 14, 1921. The Brockton Dental Society was the guest of the Medical Society. Dr. H. H. Hartung, examining surgeon for the Aetna Insurance Co., read a paper under the title of "Medical Legal Phases with Particular Reference to Malpractice Suits." There were two hundred physicians and dentists present.

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## LEGISLATION RELATING TO MEDICINE.

THE time in which effective influence may be exerted on legislative action relating to medical practice and public health has passed for this session.

The reactions of the legislature to many measures presented by physicians has been adverse. This winter's experience has been very much like that of preceding years. The legislature of Massachusetts has acquired the reputation of being conservative in its treatment of bills, directly or remotely, relating to the efficiency of physicians and standards of medical education. Although freak bills, such as those applied to the regulation of the heels of Women's shoes, have been quickly disposed of, serious recommendations designed to raise the standards of medical practice have, with one exception, received adverse action. Matters which have led to disputes among physicians, as the maternity bills, are not referred to, because it was to be expected that a body of laymen would shrink from enacting into law, bills which have caused dissention in the ranks of the profession. But when a bill is presented which represents the trend of events and is supported by reputable physicians and recognized experts, and which is rejected, one may be pardoned for failure to understand the working of a legislator's mind.

In order to profit by experience, those who have the responsibility of representing the profession should study the conditions which influence the attitude of members of the General Court toward the recommendations of physicians. It is possible that the medical profession is loosely organized in its campaign for constructive legislation. It is true that the Massachusetts Medical Society and the Massachusetts Homœopathic Medical Society have a joint legislative committee. This committee meets in the autumn and creates an auxiliary committee representing the senatorial and representative district throughout the state. These committees are called together and such proposed legislation as has been formulated is discussed and approved or opposed, as the case may be. Afterward it has been found that there is difficulty in securing attendance at meetings, the probable reason being that most of the men living at a distance feel that the presidents of the societies and their immediate associates will attend hearings and give such advice as the subject under discussion warrants. It is true that the central committees send circulars of information to the members of the auxiliary committee, but there has seemed to be little evidence of effective work.

Everybody concedes that the great body of law makers are honest men, actuated by a firm sense of duty, and a determination to enact laws which will meet the approval of the masses; and right here the great element of chance comes in, for the legislature is besieged by people who are sincere, but who are not always able to determine what is good and what is bad, but whose evident honesty, together with support of associates equally illogical confuse the minds of legislators, and when arguments of proponents seem to offset those of proponents, endorsement of a good measure is denied.

One should put himself in the place of the legislator in order to understand his reactions. His mind is burdened with a multitude of somewhat complex questions with opposing forces contending for his support. He cannot take time to ascertain the attitude of his constituents and hence he sometimes drifts with the current set in motion by some forceful person.

Like most people, he is vulnerable to the malign suggestion of trust, to abuse of power, or a desire to crush out weak organizations, and is unconsciously swayed by such claims.

The unpleasant and often unproductive attempt to influence legislation, has led some men to propose that medical organizations should retire from the field and let the people act unguided and uninspired. It is argued that physicians know how to protect themselves and that effort to secure public health measures is a thankless task unless the people ask for protection. On the other hand, can physicians with understanding remain quiet, when there is danger to public health, or possibility of fraud?

If anything is to be accomplished there must be organization and intensive effort. We can profitably learn from politicians that the time to inaugurate a movement is in advance of conflict and if future members of the legislature are to know the wishes of their constituents, there should be laid a foundation of knowledge. Every well qualified physician should be engaged in securing the support of his community for those measures which lead up to more efficient practice and the discard of pernicious or selfish ambitions.

The time to act is now. The disappointments of this legislative session are fresh in mind. The people will demand support of progressive medical legislation, if informed. Let the legislative committees enter upon a campaign of education in every community, taking, for example, the benefits of vaccination, the need of well educated and trained practitioners, and such other questions as have met the unanimous approval of the profession.

## MEDICAL NOTES.

In order that physicians may know facts, the Journal will publish such items as may be helpful in teaching the laity.

Banquet For Visiting Medical Women of the A. M. A.—On Wednesday, June 8, 1921, the Medical Women of Boston, have arranged for a banquet for the Medical Women attendthe A. M. A. at the Hotel Vendome, at 6 P.M. Tickets $3.00. In order to facilitate arrangements, those wishing to attend are requested to notify Dr. Florence W. Duckering, 520 Beacon Street, Boston, Mass., on or before June 1. Tickets may be obtained at the registration booth at headquarters on June 6.

The Election of Major General Wood to the presidency of the University of Pennsylvania, forcasted for several weeks, was consummated April 18, 1921. The title to be conferred is held in abeyance pending amendment to statutes. It is reported that the trustees intend to arrange for a division of the administration and educational policies. The arrangement is said to be the first of its kind in America. The Boston friends of General Wood will be pleased with the recognition of his executive ability shown on many occasions.

The National Safety Council will hold its annual congress in Boston next September, in response to an invitation from the Massachusetts Safety Council. It is difficult to realize that nearly three times as many of our people were killed by accidents, as the number of American soldiers killed in the European War in the same period. This frightful loss of human life goes on and causes little comment except by those who are studying this waste of life. Fortunately, competent men are devoting their lives to the problems incidental to accidental deaths, and Massachusetts has taken an advanced position in this movement.

The Haverhill Red Cross has established three well baby clinics, a milk-at-cost station, but distributes milk free to those unable to pay for it. Nutrition squads have been formed so that children showing evidence of underfeeding may be dealt with. The financial depression is reported to have been responsible for evidences of malnutrition.

Massachusetts General Hospital Staff Meeting.—A meeting of the staff was held on Monday evening, April 25. Dr. J. C. Aub, Assistant Professor of Physiology in the Harvard Medical School, spoke on the adrenals. Dr. Aub called attention to the fact that the adrenal consists really of two distinct glands—the cortex and the medulla. The medulla, or central portion, is derived embryologically from the sympathetic nervous system. It is innervated by the sympathetic nervous system, and secretes adrenalin, which reinforces the action of the sympathetic nervous system. So far as we know, its sole function is the secretion of adrenalin. The function of the medulla can be practically eliminated by destroying its innervation. Such action does not cause the death of the animal. There is no laboratory evidence that the height of the blood pressure depends upon the amount of adrenalin secreted. The cortex, on the other hand, is essential to life. Very little is known of its function. Forty per cent. of the adrenal gland is composed of lipoids; these are mostly in the cortex. The lipoids of the cortex are not diminished in fat-wasting diseases. The cortex seems to be a factor in cholesterin metabolism. One observer has produced ateriosclerosis in rabbits by feeding cholestrin. It has been noted that influenza cause lesions in the cortex, a fact which may account for the lassitude so commonly felt after influenza. Diseases of the cortex, such as tumors, cause precocious sex development, and in the female, an assumption of secondary masculine characteristics. Removal of both adrenal glands in cats is followed by death in a few days. The animals manifested lassitude and anorexia, but appeared contented. They are capable of a single effort, such as a leap, but cannot maintain action.

## Correspondence.

### HUMAN VIVISECTION.

1729 Chestnut St., Philadelphia, Pa.,
April 5, 1921.

*Mr. Editor:—*

In *The Starry Cross* (the Philadelphia Antivivisection journal of which Mr. R. R. Logan is the editor), for March, 1921, is an article of about 2500 words by the associate editor, Mrs. M. F. Lovell, entitled "An Answer to Dr. Keen."

This answer is to my article on "Vivisection" in *The Country Gentleman* for February 12, 1921. In this article, I quoted Mrs. White's much earlier proposal for "Experimenting on human beings." Mrs. Lovel begins by saying: "One of the most common of these [gleams of virtue] is a reluctance to criticize the dead, and seldom , indeed, except by the most unscrupulous, is a direct accusation brought against one who, being no longer in this life, is unable to refute it." As to this general assertion, I need only remark that Pasteur, Lister, Claude Bernard, Brunton, Behring, and scores of other research workers, are constantly "accused" by antivivisectionists, without number, of cruelties and other faults. It is the current coin of their literature. Yet all of these men are "no longer in this life and [are] unable to "refute" such accusations. It seems, then, that it is a crime to criticize a dead antivivisectionist, but a virtue to lash and misrepresent a dead experimenter. Does not the old adage say, "What is sauce for the goose is sauce for the gander"?

As to the positive inference that I had refrained from accusing Mrs. White of advocating human vivisection while she was living, and only did so, when being dead, she could not reply, it is absolutely incorrect. I accused her over four years before her death and she, herself, quickly published two replies to my charge, one in the Boston Medical and Surgical Journal, and the other in the *Journal of Zoöphily.*

Recently, I passed my eighty-fourth birthday. Though Mrs. Lovell does not mention this, she undoubtedly had in mind my impending (and, I may add, *sotto voce,* my undoubtedly welcome) demise. In view of the uncertainty of my life (*sic*), she thinks, before death stills my pen and voice, I ought to retract the statement that Mrs. White advocated human vivisection. On the contrary, I reaffirm it and call the then living Mrs. White as my witness.

Let us see just what Mrs. White *did* say in 1886, in her "Reply" to my address, "Our Recent Debts to Vivisection." Referring to the 20,000 annual deaths from snake bite in India, she proposed that the "experimenters go to India, where they could find as large a field for investigation as they require in the *poor victims themselves.* Here is an opportunity such as is not often afforded of EXPERIMENTING UPON HUMAN BEINGS, since, as they would infallibly die from the snake bites, there *can be no objection* to trying upon them every variety of antidote that can be discovered." (I use italics and capitals not to change the sense, but solely for emphasis.) If I understand the English language, advocating "experimenting on human beings" is flat-footed advocacy of "Human Vivisection." It can mean nothing else.

In the Boston Medical and Surgical Journal, May 2 and 9, 1912, is printed a later address of my own, entitled "The Influence of Antivivisection on Character." In this address, I quoted Mrs. White's suggestion of 1886 of "experimenting on human beings" bitten by snakes. To this address, Mrs. White herself replied in a 3500 word letter (Boston Medical and Surgical Journal, July 25, 1912). Let us see what was her own reaction *more than four years before her death* (September 7, 1916) to my quoting her proposal. Did she declare that I was "unscrupulous" and deem it an "aspersion" on her character? Not a bit of it! She not only did not resent my quoting and interpreting her own words, but, after having had twenty-six years to reflect upon her proposal to "experiment upon human beings," she gallantly stood by her guns and defended it! Her own words are (Boston Medical and Surgical Journal, July 25, 1912): "It does not seem to me that this is a cruel suggestion, as my only object in it was to benefit the poor natives who die by the thousands every year!"

If Mrs. White, while living, did not resent my quoting her own words, as "aspersing" her character, why should Mrs. Lovell and Mr. Logan now so violently resent it?

But let us search a little further and consult the *Journal of Zoöphily* (the former name of what is now *The Starry Cross*), itself the organ of the antivivisectionists themselves. In 1912, Mrs. White was the editor and Mrs. Lovell, as now, "associate editor" of that journal!

In the issue for September, 1912, page 380, I find that Mrs. White's letter, first published in the Boston Medical and Surgical Journal, of July 25, 1912, is reprinted in full, under the title "The Self-defense of an Antivivisectionist." So here, in Mrs. White's and Mrs. Lovell's own *Journal,* Mrs. White failed to resent my suggestion that she favored "experimenting on human beings," but, actually, after years of reflection, defended it.

By entirely omitting any mention of the facts that the address in which I had quoted her was published four years and four months *before* Mrs. White's death, and that she, herself, replied to it in print, not only in the Boston Medical and Surgical Journal, but in the very journal of which Mrs. Lovell was, and still is, the associate editor,—by ignoring these facts Mrs. Lovell and Mr. Logan give the wholly false impression that my charge that she had made a flat-footed proposal to "experiment on human beings" was not made until after her death when she could not reply. If Mrs. Lovell and Mr. Logan knew of her two replies, they concealed the truth from their readers. If they did not, they were lamentably ignorant of the literature relating to their own business and to the contents of their own journal. In either case, it is they who should make a retraction and offer me an apology for such a misrepresentation.

The outstanding feature of all antivivisection literature, as to medicine, is that they "know it all." My friends and I, who have diligently studied and taught and practised medicine for forty, fifty and sixty years, deplore our ignorance about many things as to which we long for more light. We wish by all possible means, including animal experimentation, to obtain this additional light. We do know enough, however, to say that Mrs. Lovell's oracular statements as to typhoid fever, yellow fever, smallpox, sanitation and the "stupendous folly of germ hunting" are utter nonsense.

"Yellow fever, like typhoid, is a filth disease. Remove the filth and you remove the cause," is one of her bold assertions.

This assertion is not true. They are two diseases, each caused by its own specific "germ" and by nothing else. The fact is, you may like in a filthy hovel and may develop other diseases, but you will not develop typhoid unless there are *typhoid germs* in the food you eat and drink. In the same filthy surroundings, you will *not* develop yellow fever unless there are infected mosquitoes to bite you.

On the contrary, you may live in Mrs. Lovell's own home, with spotless ultra-sanitary surroundings, but if you eat solid food over which have crawled flies with typhoid germs on their little feet, or drink water or milk which has no smell and which looks and tastes and appears to be entirely wholesome but which contain the "germs" of typhoid, you will fall a victim to typhoid. If, in similarly perfect surroundings, you are bitten by an infected mosquito, you will be attacked by yellow fever.

But Mrs. Lovell may say this is exactly the "filth" that she refers to. I grant it at once and point out that this filth is composed of the bacilli of typhoid fever. Mrs. Lovell, if she makes that statement, at once concedes my contention that typhoid fever is caused, not by filth *per se*, but by filth which contains the germs of typhoid.

The *Boston Journal* gave place in its issue of July 11, 1912, to a short letter from Mr. Stephen Coleridge, criticizing my address of 1912, and again, on July 25, 1912, it published Mrs. White's long letter. The editor then said: "It is only just that these two communications should appear in the *Journal*, since the cause of truth is never better served than by the free expression and fair hearing of diverse opinions about it."

As soon as I read Mrs. Lovell's attack upon me, I requested the editor of *The Starry Cross* to allow me equal space for a reply. He curtly "advised" me that "'the columns of the *Starry Cross* are not open to articles favoring vivisection, or intended to asperse the memory of its founder."

As *The Starry Cross* refuses to let the light penetrate the minds of its readers, I am asking the courtesy of your columns as you believe that truth is best attained by hearing both sides.

Yours truly,<br>
W. W. Keen.

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## RATES FOR DOCTORS' TELEPHONES.

173 School Street, Milton, Mass.<br>
April 25, 1921.

*Mr. Editor:—*

In regard to the proposed increase of rates for physicians' use of the telephone by listing them under business rates, I find that in my own instance this is going to make an increase of about 50%, which I assume is an average, and without material benefits accruing thereby to the Telephone Company. The argument that the names of doctors will be classified in the back of the directory under "physicians and surgeons," does not practically work out to the advantage of either the patient or doctor, as witnessed by a recent experience in which a patient called me to ask the name of a well knows oculist, the spelling of whose name did not conform to the usual, at least in her mind, and she did not turn to the business directory for further information. Moreover, in the last few years, the change to smaller type and the multiplicity of names of those who are subscribers in the telephone directory, make the task of ferreting out names and numbers increasingly difficult, so that it occurs to me that we, as physicians, have much to gain if we allow our names to be published under the residence rates, and for the benefits of the people and ourselves get out a doctors' directory of our own which we can buy at cost and distribute to our patients according to our several communities.

Since this proposal of the Telephone Company is to cover all of its territory in New England, it might be of interest to our fraternity in other states than Massachusetts that their state medical societies, as ours, should take this matter up and serve their members and the patients who depend upon them, better than it is possible to be served under existing, or proposed, conditions by the N. E. Tel. & Tel. Co.

As directories are of passing interest, whether medical or telephone, it would need semi-yearly revision, or thereabouts, but enacted as a State Medical Society measure, it might well be done and receive the universal support of the medical practitioners at a great financial saving to themselves and to the real benefit of those who would find use for such a Directory. It is undoubtedly a fact that many subscribers have put in telephones that they might be able to call upon doctors in case of emergencies and for this single reason it seems to me unjust that this company should attempt to capitalize, at our expense, the assets that the medical profession has brought it.

Yours very truly,<br>
Walter A. Lane, M.D.

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## IMPORT DUTIES ON TOOTH BRUSHES.

New York City, April 25, 1921.

*Mr. Editor:—*

The attention of the Oral Hygiene Committee of Greater New York has been called to the fact that in the new tariff bill is a clause which increases the duty on imported brushes. This includes imported tooth brushes.

Tooth brushes are essential in the maintenance of mouth hygiene, and mouth hygiene is closely related to health, therefore, any duty which increases the cost of tooth brushes will work a hardship upon a large class of our people. Parents of large families will find it difficult properly to provide their children with this necessary article of mouth cleanliness.

Our committee respectfully requests your coöperation. We ask your readers to send letters to their congressmen and senators, protesting against any increase of duty upon imported tooth brushes; and we earnestly request that tooth brushes be placed on the free list, as they are by no means luxuries, but articles of ncessity for the health and welfare of the people.

Respectfully yours,<br>
Thaddeus P. Hyatt, *Chairman.*

## NOTICES.

### EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold an examination in Boston, June 14 to 21, inclusive.

Subjects: Anatomy, Clinical Physiology, Physiological Chemistry, Pathology, Bacteriology, Materia Medica and Therapeutics, Medicine, Surgery, Obstetrics and Gynecology, Hygiene and Sanitation. The certificate of the National Board is accepted as equivalent to a professional examination by the Federal Services and a large majority of State Medical Examining Boards.

Eligibility for examination: A four-year high school course, two years of acceptable college work, including physics, chemistry, biology and a modern foreign language; graduation from a Class A medical school, and one year as interne in an acceptable hospital or laboratory; application for examination will be considered from interne who had completed at least six months of interne service.

Applications should be made before May 25, to allow for proper investigation of credentials.

Information and application forms may be obtained from Dr. Horace D. Arnold, 520 Commonwealth Avenue, Boston. Dr. Arnold may be seen at his office from 4 to 5, Mondays, Wednesdays and Fridays, until May 25, or by appointment.

New England Pediatric Society.—The seventieth meeting of the New England Pediatric Society will be held at the Boston Medical Library on Friday, May 13, 1921, at 8.15 p.m. The following papers will be read: The Pediatrician and the Mentally Defective Child, Walter Fernald, M.D., Waverley; The Physiology, Feeding and Care of Premature Babies, William W. Howell, M.D., Boston; Abdominal Tuberculosis in Infancy and Childhood, William E. Ladd, M.D., Boston. Light refreshments will be served after the meeting.

Henry I. Bowditch, M.D., *President*,
Lewis W. Hill, M.D., *Secretary*.

Hearing on Telephone Rates.—Upon the petition of the Somerville Medical Society, protesting against the change in classification of telephone service for physicians by the N. E. Tel. & Tel. Co., the Commission will give a hearing at its hearing rooms, 166 State House, Boston, May 12, 1921, at 10.30 o'clock in the forenoon.

The presence, personally, at this hearing of all physicians who feel that the Public Utility Commission should refuse to allow the change, will be a great help, but, if impossible to attend, a strong letter of protest should at once be sent to the Commission by each individual physican. Address all letters of protest to the Public Utility Commission, State House, Boston, Mass. If the senator and representative of your district feel that the proposed discrimination against the physicians is one that should be prevented, and can become interested enough to also write to the Commission, much good will be accomplished. To prevent your yearly bill for telephone service from being greatly increased, or the alternative of being compelled to pay a measured rate instead of an unlimited residence rate, you must act at once.

Massachusetts General Hospital.—Staff clinical meeting, lower out-patient amphitheatre, Monday, May 9, 1921, at 8 p.m. Program: 1. Interpretation of Pyelogram, E. Granville Crabtree, M.D.; 2. A Report of the Dermatological Cases Treated with X-ray, C. Guy Lane, M.D.; 3. A Preliminary Report of the Findings of 2000 Gastro-intestinal Examinations Made During the Year 1919, A. S. Merrill, M.D.; 4. Some Observations on the Results of Treatment of Carcinoma of the Breast with the X-ray, K. F. Kesmodel, M.D. Doctors, nurses and medical students invited. F. A. Washburn, M.D., *Resident Physician*.

Medical Veterans of the World War.—There will be a meeting of the Association of the Medical Veterans of the World War on the day preceding the meeting of the scientific sections of the American Medical Association, the time and place to be announced later. Col. V. C. Vaughan is president of the Association, and Col. F. F. Russell, U.S.A., secretary. All medical officers, contract surgeons of the U. S. Army, and acting assistant surgeons in the United States Public Health Service, who have served in the Medical Corps of the United States Army, United States Navy and United States Public Health Service, and all members of medical examiners of local, medical advisory and district boards, officially appointed by the President of the United States, the Provost Marshall General of the United States Army, and the Governors of the various states are eligible to membership in this organization. The object of this Association "is to perpetuate fellowship, to prepare history, secure coöperation for the mutual benefit of the medical men who served in the World War, 1914-1918, and for the mutual improvement and social intercourse of its members."

The American College of Physicians has established the Massachusetts Section of the Clinical Congress. The first meeting will be held in Springfield, May 13 and 14, 1921.

The Norfolk District Medical Society.—Seventy-first annual meeting, American House, Boston, May 10, 1921, 5.30 p.m.

Nominating committee's list of nominations for 1921-22: President—Dr. C. D. Knowlton, Roxbury. Vice-President—Dr. John P. Treanor, Dorchester. Secretary—Dr. Bradford Kent, Dorchester. Treasurer—Dr. G. W. Kaan, Brookline. Commissioner of Trials—Dr. M. V. Pierce, Milton. Nominating Councillor—Dr. A. N. Broughton, Jamaica Plain, Dr. D. N. Blakely (Alternate), Brookline. Censors—Dr. C. F. Stack, Supervisor (Acting), Hyde Park, Dr. E. T. Rollins, Jamaica Plain, Dr. T. J. Murphy, Roxbury, Dr. G. G. Bulfinch, Brookline, Dr. A. A. MacDonald, Dorchester. Councillors—Dr. C. E. Allard, Dorchester, Dr. W. B. Batchelder, Dorchester, Dr. E. H. Baxter, Hyde Park, Dr. D. N. Blakely, Brookline, Dr. E. J. Breaton, Dorchester, Dr. J. P. Broderick, Jamaica Plain, Dr. A. N. Broughton, Jamaica Plain, Dr. J. A. Ceconi, Dorchester, Dr. T. F. Greene, Roxbury, Dr. W. H. Greene, Roxbury, Dr. W. A. Griffin, Sharon, Dr. R. W. Hastings, Brookline, Dr. C. F. Jillson, Jamaica Plain, Dr. G. W. Kaan, Brookline, Dr. W. B. Keeler, Roxbury, Dr. Bradford Kent, Dorchester, Dr. F. P. McCarthy, Milton, Dr. M. V. Pierce, Milton, Dr. H. H. Powers, Brookline, Dr. Victor Safford, Jamaica Plain, Dr. G. H. Scott, Roxbury, Dr. C. F. Stack, Hyde Park, Dr. Max Sturnick, Roxbury, Dr. Augusta Williams, Brookline.

Dinner, 6.15 sharp. After the dinner the addresses will be given by Benjamin Loring Young, Speaker of the House of Representatives, and Timothy Leary, M.D.

G. W. Winchester, *President*.
Bradford Kent, *Secretary*.

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## RECENT DEATHS.

Dr. John Gavin Morris, a Fellow of the Massachusetts Medical Society, died at his home in South Boston, April 11, 1921, aged 65 years. The son of Dr. Patrick Morris, one of the best known druggists of Boston, John Gavin was born in that city, March 26, 1856. He attended the Lincoln School in South Boston, the Boston Latin School and Harvard College, where he was graduated in 1879. Going to Harvard Medical School, he received his M.D. in 1882, and began practice in South Boston at once. In 1889 he joined the Massachusetts Medical Society. At one time he was visiting physician to St. Elizabeth's Hospital, when it was at 61 West Brookline Street.

Dr. Morris, who was unmarried, is survived by three brothers, one of them being Dr. George P. Morris of South Boston.

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## Address.

### INSTRUCTION IN CLIMATOLOGY IN MEDICAL SCHOOLS.*

By Robert DeC. Ward, Cambridge, Mass.,
*Professor of Climatology, Harvard University.*

The relations of climate and health have long been recognized as distinct sub-divisions of medicine and climatology. The term, medical climatology, has long been accepted as an appropriate designation for this border-line subject. Although climatology has a wide range of applications, to agriculture, to industry, to commerce, and the like, but few sub-divisions of its general field have as yet received such special designations. While a great deal of important work in medical climatology has been accomplished, in the United States as well as in other countries, there is still need for extended research in this field. The chief difficulty in the way, as it appears to me, is the fact that so few medical men have an adequate knowledge of what meteorology and climatology really include, and so few students of the earth's atmosphere are in any way competent to deal with the physiological and medical aspects of their science. This clearly presents a situation in which, with rare exceptions in the case of physicians who have a thorough knowledge of climatology, or of climatologists who are at the same time physicians, really sound and useful work can only be accomplished by coöperation. Trained physicians, with special interest in and appreciation of the laws and scope of climatology and trained climatologists, with at least a good working knowledge of the history and the causes of the more important diseases, should work together.

In the United States, the American Climatological Association, the name of which was recently changed to American Climatological and Clinical Association, has for years been active in the study of medical climatology, and its publications contain a large number of important contributions on various aspects of the subject. Further, we have been fortunate in having, in this country, some practising physicians whose knowledge of climate has qualified them to deal with medical climatology as experts in the science of the atmosphere. In this connection, special mention should be made of the work of Dr. Guy Hinsdale, who has, from the start, been one of the most active members, and recently president of the American Climatological and Clinical Association, and whose numerous publications have been of great value in promulgating sound doctrine where sound doctrine has been distinctly needed. Dr. Hinsdale's recent volumes, prepared in collaboration with Dr. F. Parkes Weber, are a monumental piece of work, far too little known among professional meteorologists and climatologists.[1]

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* Excerpts from a Presidential Address on "Climate and Health with Special Reference to the United States," read before the American Meteorological Society, at Chicago, Ill., Dec. 29, 1920.

The late Dr. S. Edwin Solly, long a practising physician in Colorado Springs, also made a valuable contribution to the literature in his "Handbook of Medical Climatology," which may well find a place on the shelves of working meteorologists who aim to keep abreast of the times in the matter of the larger relations of their science to health.[2] Mention should also be made of the work of Dr. Isaac M. Cline, at present Section Director of the United States Weather Bureau at New Orleans, La., a doctor of medicine as well as a professional meteorologist, whose writings clearly indicate what can be accomplished when a knowledge of medicine and of climatology are combined in one investigator.

If the names of many others are here omitted, it is not because of failure to appreciate their work, but partly for lack of time and partly because it is in no way the purpose of the present Address to give an historical or bibliographic account of the literature.

While the United States has contributed a notable share to the advance of medical climatology, there is need of effective and widespread coöperation between our medical men and our climatologists, in thorough, scientific, progressive research into the many and varied relations of climate and health. The American Meteorological Society may well give special attention to this matter. It should, by coöperation with the American Climatological and Clinical Association, and with medical men generally, endeavor to advance investigation and sound learning along these lines.

The large majority of medical men know little about climatology, for the reason that little or no attention is paid to this subject in our medical schools. Some years ago I sent a short questionnaire to the heads of the leading medical schools in the United States, asking what instruction in any aspects of climate was being given, or contemplated, in their schools. It appeared that at that time very little climatology was being taught, even in its more obvious and direct relations to disease. The situation has not changed since then, so far as information at my disposal goes. In a few sporadic cases only were short courses of lectures on some aspects of climatology being given. The reasons for this unfortunate situation are two: (1) the program of the strictly medical subjects is already so crowded that there is thought to be no room for another subject, and (2) the lack of competent teachers to give the instruction in the proper way. About twenty years ago I offered to give, without compensation, a course of lectures on climatology at the Harvard Medical School, but the offer was declined on the ground that the instruction could not be required of the students because of the already over-crowded curriculum, and because, if the course were optional, few if any students would elect it. I hasten to add, in justice to the progressive policy of the Harvard Medical School, that when our Graduate School of Tropical Medicine was established, a few years ago, the list of studies included a course of about fifteen lectures on tropical climatology. This instruction, which it is my privilege to give, has, I believe, proved interesting and valuable to the students, and it has certainly been a most inspiring task to the teacher.

Because of this general lack of climatological instruction in our medical schools, it results, inevitably, that only an occasional physician who, because of his natural interest in climate, or because his special practice forces him to acquire some knowledge of climatotherapy, becomes in any way an authority on this subject. To the vast majority of medical men, it is safe to say, climate has a very vague meaning. They think of it in some such terms as "a dry, bracing climate"; or "a mild, relaxing climate," or "a climate with marked and sudden weather changes." If they desire numerical data, they are usually satisfied with the mean annual or mean seasonal temperatures, the mean annual rainfall, and with some general information regarding the relative humidity, or the cloudiness. They do not realize, for they have had no opportunity to learn, what a varied complex climate really is; how large an amount of numerical data is necessary if a complete picture of a climate is gained. Meteorology, by means of its great body of statistical information, patiently and carefully collected throughout many years of faithful observation, is ready to supply the medical profession with all the information which is available, and is further not only willing but anxious to secure any further details which physicians need, if only the exact need is made clear. Far too few physicians realize the importance, in the practice of their profession, of many of the standard climatic data which are now available for most health resorts. It is unnecessary on this occasion, to make anything like a complete list of such data. The following may be mentioned as illustrations: the intensity and duration of bright sunshine; the periodic and non-periodic diurnal range of temperature; the mean diurnal variability of temperature; mean temperatures of the different hours of the day; frequency of temperature changes of certain amounts; relative humidity of the different hours, or at least of a morning, afternoon and evening hour; number of rainy days for each month; duration of snow cover; number of days with snowfall; number of clear, fair and cloudy days, by months; number of days with fog; distribution of fog throughout the 24 hours; daily period of wind velocity; occurrence and distribution, in time, of any special or local hot or cold winds, and so on. These are mentioned, in passing, as examples of data which are all more or less critical in determining the climatic characteristics of any locality; which have important relations to health, and which are usually wholly disregarded by the majority of physicians.

A few years ago, in a course of lectures on the principles of climatology, given before a medical audience in one of our large cities, I was bold enough to say that the trouble with my hearers was that they knew practically nothing about climatology beyond a general idea regarding the relations of climate to the treatment of tuberculosis, and that they were, therefore, not in a position to give the general run of their patients sound advice as to the choice of the best climate for the treatment of other diseases. There was a distinct reaction on the part of my audience to this very frank and somewhat impolite challenge, and a good deal of murmured comment, but I could detect no evidence of any general feeling that the statement was exaggerated. At the close of the lecture, one of my hearers, a medical practitioner of more than nation-wide reputation as a specialist on lung diseases, said to me: "You gave the medical profession a hard knock when you said that, but it is true, and we deserve it."

It seems to be clear, then, that it is our business to impress upon the authorities of our medical schools the importance of offering some instruction in the principles of climatology as a part of the regular curriculum for all medical students. There are many professional meteorologists in the United States who are competent to give this instruction if, among the available teachers in the medical faculties there should happen to be none who feel themselves qualified to do the work. That we must, in most cases undoubtedly, give such instruction without any remuneration will not, I feel sure, in any way militate against our doing our part in this important work, if opportunity offers.

REFERENCES.

[1] A System of Physiologic Therapeutics. Edited by Solomon Solis Cohen, M.D. Vols. iii and iv. Climatology: Health Resorts—Mineral Springs. by F. Parkes Weber, M.D., with the collaboration for America of Guy Hinsdale, M.D., 8 vo., Philadelphia, Pa., P. Blakiston's Sons & Co., 1901. (Book I. Principles of Climatotherapy—Ocean Voyages—Mediterranean, European and British Health Resorts. Book II. Health Resorts of Africa, Asia, Australasia and America—Special Therapeutics, pp. 86-218 on the United States, and pp. 245-387 on Climatotherapeutics. In Vol. iv, "will be found what is believed to be, on the whole, the most nearly complete account of the health resorts of the United States yet published.")

[2] S. Edwin Solly: A Handbook of Medical Climatology, Embodying its Principles and Therapeutic Application with Scientific Data of the Chief Health Resorts of the World. 8 vo. Philadelphia, 1897 (pp. 185-354 on North America).

## Original Articles.

### HEREDITARY OEDEMA (MILROY'S DISEASE). A REPORT OF THREE CASES.

By Charles F. Painter, M.D., Boston,
and
Harold C. Bean, M.D., Boston

In 1892, under the title, "An Undescribed Variety of Hereditary Oedema," Dr. W. F. Milroy[1] brought to the attention of the medical profession a type of case of which no previous accounts had ever been published. He sent his report to Professors William Osler and William H. Welch, of Baltimore, who stated that this disease was absolutely new to them and that they were unable to find any literature on the subject.

Milroy's case was typical of the disease and interesting both from the pathological, as well as the geneological standpoint. He presented the case of Mr. H., a middle-aged clergyman, whose legs were obviously enlarged from birth, but caused him no inconvenience other than local weight and clumsiness. The most interesting facts, however, were the apparent hereditary characteristics which were fortunately found in this particular case, a table of which follows:

In this list there are six generations comprising ninety-seven individuals, twenty-two of whom had this deformity. Of the twenty-two cases, twelve were males, seven were females, and the sex of three was unknown.

It was also noted that in later generations the

TABLE OF GENEALOGY OF MR. H., WITH LESIONS MENTIONED

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Relative of Mrs. H. (One enlarged leg) | Joseph W. Both legs enlarged | 1. Unknown | | | |
| | | 2. One leg | 6 children<br>3, foot each | 11 children<br>2, foot each | |
| | | 3. Normal | 8 children<br>1, foot | 9 children<br>normal | |
| | | 4. One leg | | | |
| | | 5. Normal | 5 children<br>1, leg | 9 children<br>1, both legs<br>1, a foot | |
| | | 6. Both legs | 4 children<br>1, leg | 4 children<br>1, foot | 6 children<br>1, a foot<br>1, both legs |
| | | 7. One foot and ankle | 3 children<br>1, foot | | |
| | | 8. Unknown | | | |
| | | 9. One foot and leg | 4 children<br>1, (the applicant) both legs enlarged | 13 children<br>normal | 2 children<br>normal |

same frequency prevailed, but the oedema was much less in extent. Reversion to familial types is seen after a normal generation.

There were three exceptions to the congenital characteristic of the disease:

1. Normal extremities until, in adult life, a carriage accident caused the enlargement of one leg.

2. Normal extremities until the twelfth year when, without any obvious injury, an ankle became red, painful, and swollen. The first two symptoms rapidly subsided leaving a permanently enlarged ankle.

3. An enlarged foot until maturity, when testicles became involved. One testicle was so large that it was removed by operation whereupon the foot returned to normal size and remained so.

Dr. William Osler[2] reported Dr. Milroy's case in his book, "Modern Medicine," but does not cite any cases of his own.

In 1898, Meige[3] described eight cases appearing in four generations.

In 1902, Rollston[4] reported three cases in two generations.

In 1908, Hope and French[5] reported thirteen cases occurring among forty-two individuals in five generations, some of these cases appearing in adult life and associated with sudden onset with fever, pain and redness. No new theories were advanced as to cause or treatment. All cases apparently showed the same symptoms.

Since 1908 little has been heard of further cases, nor has much been said regarding the disease itself.

5738, Miss L., July 6, 1920. A strong and unusually healthy Irish girl appeared at the office with her right leg very much enlarged, causing her much mechanical inconvenience. This condition had come on gradually from puberty; beginning in the lower leg and extending into the thigh. The foot was not involved. She was otherwise perfectly well and had had no injuries which could have caused this growth. At no time had she ever been in the tropics. She came from Ireland to New York, and thence to New England, where she had lived for some years. She worked as a cook in a family. She knew of no other instances of a similar nature in her family.

Local Examination—The right leg, beginning at the ankle and extending well up to the groin, was symmetrically about four inches larger in circumference than the left. It was hard and pitted with difficulty. The circulation was somewhat sluggish and the foot was cold. There was no indication of varicose veins.

This patient was referred to an internist who, after careful examination, was unable to find any cause for the enlargement.

She was advised to bandage the leg and to have periodic courses of massage. No benefit had resulted when last seen.

5765, Miss W., July 20, 1920. A young Jewess of 20 years, who has always been well up to five years ago, and so far as any constitutional symptoms are concerned, is still perfectly well.

Five years ago she went to bed one night perfectly normal and woke in the morning with the left lower leg considerably swollen and the thigh moderately so. There was no pain or congestion. It gave her no particular inconvenience. It gradually increased in size for a few months. At present she tires easily because of the weight which she is obliged to carry around. No family history obtainable.

About four years ago she entered the Peter Bent Brigham Hospital in Brookline, Mass., for observation. The examination was entirely negative. The Wassermann was negative. She states that at the present date her leg is somewhat smaller than usual, but that frequently, without warning, it swells to enormous size.

Local Examination—Left leg, at mid-thigh is 19½ inches in circumference, as against 18¾ on the right; at patella is 16¼ as compared with 15 inches on the right; at the calf is 16¾ inches as against 14¼ inches on the right. The foot is 10⅜ inches over the instep as against 9½ inches on the right. Abdominal examination was negative. X-ray of the pelvis was negative; of the affected leg was normal except the increase in the shadows of the soft parts. She was advised to bandage and massage the leg, but no relief was obtained from this treatment.

5782, Mr. W., July 30, 1920. A middle-aged man who states that eight years ago he began to notice a slight increase in the size of his right leg and that the growth has increased slowly ever since. It sometimes swells to enormous size so that a 35-inch pant at the knee is required to hide the deformity. There is no pain and only a discomfort due to size and weight. Some months previous to the first appearance of this trouble he had typhoid fever. He was sick for a month and then developed pneumonia, but recovered quickly. He was a ball player when young, and received many hard knocks in and about the knee-joint, but was never seriously injured. To the best of his belief there were no lesions of this kind in his family.

Local Examination—Right leg slightly larger than the other because canvass stocking which he has worn for two years has kept the leg within normal limits. Pits very slightly on pressure. No congestion. No varicosities. There is a definite brawny sensation over the whole leg. Advised to massage and to use a vibrator. Not seen since.

These three cases, the only cases so far available, appeared at this office within a period of a month. All three cases were apparently normal at birth. Two cases appeared about the time of puberty. One case appeared late in life, that is, at the age of thirty-five. One case developed over night and the other two very gradually. All three gave the same complaint, namely, mechanical discomfort. All three were perfectly healthy. But, unfortunately, all three were unable to give any light on the question of heredity.

Race, sex, age, and climate seem to be no factor in this malady. Undoubtedly, if family pathology could be traced back two or three generations, more, probably many such cases could be found.

Dr. Osler placed this disease in the category of angioneurotic oedemas. These are allied in so far as they are probably hereditary and are oedemas without the usual causes, such as cardiac, renal, etc., but they differ in many ways. In the first place, this type of oedema is confined to the lower extremities. It is also permanent where found, and is not associated with any systemic disturbances. Finally, hereditary oedema has been unassociated so far with any neurosis. Certainly the three cases reported above were far from neurotic. Previous reports are also conspicuous because of the absence of any mention of nervous phenomena.

At the time of writing, another case has appeared at this office which may be included among border line cases; that is, between the angioneurotic type and the hereditary disease.

This was a middle-aged Jew who had worked hard all his life, being constantly on his feet during the day. About three years previous to entry he had two or three weeks of marked swelling of his left lower leg without pain or redness. No treatment was given, but the leg returned to normal proportions quite suddenly. About a month previous to entry he began to experience rather intense pain through his left shin and gradually the lower leg, not including the foot became quite wsollen. He noticed that the leg enlarges rapidly upon standing. The pain is gradually subsiding but the swelling remains. He has never had any other part of his body affected in this manner. He has always been healthy. He has not noticed any gradual enlargement of his feet or hands.

He states that he only knows about his immediate family, a mother and eight brothers and sisters, all of whom are well and have no enlarged feet or legs.

This patient ha sbeen examined by hree local doctors, without any cause having been found for his oedema.

Local Examination—The left leg from the knee to the ankle is three and one-half inches larger than the right leg, in spite of firm bandaging. There is a definite brawny feel to the whole area. There were no indications of varicose veins. The dorsalis pedis artery is readily felt. The oedema is hard and pits with difficulty. There is no apparent increase in surface temperature.

His hands and feet seem enlarged. but there is no other indication of acromegaly. Patient was given a mixed gland tablet and advised to keep leg firmly bandaged unil some change is noted.

This case is not typical angioneurotic oedema, nor is it possible to say that it is definitely an hereditary oedema, but with the evidence at hand, it favors the later diagnosis and would then fall into the group of cases reported by Hole and French.

## CONCLUSIONS.

No theories have been advanced on this subject except heredity. One should not be satisfied with that viewpoint until every other cause has been exhausted. Indeed, heredity cannot be the entire cause, for there must be some weakness or tendency upon which heredity plays its rôle.

The nearest approach one can make in this line is upon the endocrine gland theory. In these days of rock-bottom research, glands are beginning to play a part and, with no other better reason to be discovered, the glandular theory can be applied in these cases.

Staffieri[6] mentions a case of angioneurotic oedema, with which the disease is seemingly associated, in which there was a dysendocrinia with thyroid insufficiency predominating. The only case, which has been reported as hereditary oedema, which could possibly come under this category was one in which there presumably was a testicular hypersecretion. This case was the one reported by Milroy in which a congenitally enlarged foot became normal upon excision of an enlarged testicle. If such cases are congenital, then there must be an inherited insufficiency or hypersecretion of some or all the endocrine glands. However, if this is the case, there should be other manifestations of the disorder. So far, the evidence is lacking.

REFERENCES.

[1] New York Med. Jour., 1892, Vol. lvi, p. 505.
[2] Osler and McCrae, Modern Medicine, Vol. iv, p. 1011.
[3] Presse Medicale, 1898.
[4] Lancet, 1902, Vol. ii.
[5] Quarterly Jour. of Med., 1908, Vol. i.
[6] Revista Medica del Rosario, 1919, Vol. ix.

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# RESULTS OF NERVE INJURIES APPARENTLY DUE TO BIRTH TRAUMA.

By Eli Friedman, M.D., Boston.

The following is a brief summary of 2,000 consecutive neurological cases seen in the Nerve Department of the Children's Hospital. The purpose of this analysis is to find out approximately what percentage of these unfortunates were caused by trauma in labor, either from allowing a difficult labor to go on too long without interference,—the so-called sins of omission; or from interference, as the application of forceps,—the so-called sins of commission.

I have chosen neurological cases because, while every part of the child's anatomy is subject at times to a certain amount of trauma in transit, the nervous system is the one that always suffers. All the vital organs of the child are well protected, while the brain, which is one of the most important ones, has practically very little protection. The head, furthermore, being the largest part of the child, is subjected to the greatest amount of pressure in the process of its passing through the parturient canal and consequently suffers the greatest amount of damage. Injuries to the nervous system, furthermore, result in chronic conditions which can be followed for years, and thus afford a better opportunity for study than simple surgical conditions which are of rather short duration, without, as a rule, leaving any permanent damage.

The cases studied in this series of necessity include only those with comparatively mild injuries to the nervous system. The more serious injuries either result in still births or in death in 24 to 48 hours after birth, and there are a good many of them, as we shall see later. Such children, if they came to the hospital at all, were rushed to the surgical service for decompression operations, and unfortunately very rarely reported for after treatment in the Neurologisal Service. What we shall see in these cases will be a large number of unfortunates who, while apparently but slightly injured at birth, still have enough injury to their nervous system to leave them more or less crippled for life.

Foremost of the injuries to the nervous system, as far as numbers are concerned, are the so-called Erb's or obstetrical paralysis. Of the 2000 neurological cases, 101 belong to this class. This condition, as demonstrated conclusively by John W. Seaver,[1] is caused by an injury to the brachial plexus. Traction with forcible abduction and elevation of the arm such as we find in breech delivery, puts the eighth cervical and first dorsal roots on the stretch, and when there is enough force applied complete tearing of the nerve fibres result. Traction and forcible separation of head and shoulder puts the upper cords, the fifth and sixth cervical roots of the plexus, under tension with similar results. Bullard,[2] W. U., states further that traction of the head in the axis of the body is less injurious than when it is done obliquely; and that asphyxia favors injuries in the plexus because the muscles are completely relaxed and afford very little protection to the nerve structures.

Fortunately the upper arm type is one most common. In this type the muscles of the upper arm, the deltoid, supra spinatus, infra-spinatus, teres minor, biceps, and supinator longus, are the ones involved. Occasionally the serratus magnus coraco brachialis and supinator brevus are involved. The paralysis is then due to the injury of the fifth and sixth cervical roots. In the lower arm, or rather in the whole arm type, as it is very rare to see the lower arm alone, all the muscles of the arm are involved and there is wrist drop as well as atrophy of the small muscles of the hand. In these cases, the fifth, sixth, seventh, eighth, and sometimes the first dorsal are involved. It is very rare to find the lower nerve roots involved without the upper.

The diagnosis is very easy when one looks for it. Within the first few days after birth, the arm or, as very rarely happens, both arms, are found to lie limp by the side. In the upper arm type, which is by far the most common, the arm is kept in inward rotation and adduction, with inability to abduct, elevate, outwardly rotate, or supinate.

The affected extremity is colder and the muscles undergo some atrophy, though never as marked as in infantile paralysis. The reason for this is that practically no muscle loses its complete enervation as it gets some nerve fibres from another segment of the cord so that the trophic disturbance is not so great. The electrical examination will show a reaction of degeneration in the affected muscles, but this examination is not always satisfactory on account of the excessive development of fat in children which (also hides atrophy).

The only conditions we have to differentiate from obstetrical paralysis are fracture and dislocation of the humerus, cerebral palsies and infantile paralysis. Fractures and dislocations can readily be recognized by careful examination, though we must bear in mind that there is at times some subluxation of the head of the humerus secondary to the paralysis of the muscles around the shoulder. Cerebral palsies are usually hemiplegic, involving the one entire side of the body, or diplegic, involving all four extremities and very rarely limited to one extremity. The cerebral paralyses are furthermore of the spastic type with exaggerated reflexes, while Erb's paralysis being of the peripheral type is flaccid with absent reflexes.

Infantile paralysis can be differentiated by the age of onset and only very rarely, when the patient comes late for treatment, is there any difficulty in diagnosis.

The treatment of these cases belongs mainly to the orthopedic surgeon and I will not dwell on it, but the advice to start treatment early before contractures and deformity result, lies entirely with the obstetrician. Unfortunately there is a tendency on the part of the obstetrician to minimize the injury and promise the mother that the child will outgrow it. Now it is true that in some mild cases where the injury to the nerve fibres is mild, the outlook for a complete recovery is good, but in the vast majority of instances the tendency to spontaneous recovery is very slight. In the more severe cases, where the injury to the nerve fibres was considerable, the subsequent scar tissue formation caused even extension of the paralysis by involving uninjured nerve in the scar tissue, and in some cases surgical interference apparently accomplished a good deal of improvement. Indiscriminate rubbing by the mother or nurse does not prevent hopeless deformity, and much valuable time can be saved by starting the proper treatment early, within a few weeks after birth.

Next in importance, as indicated by the number of cases, are the so-called cerebral spastics. Of these there are sixty-three. In this number I have tried to include only those, who from the history and physical examination appear to have been caused by trauma at birth. Thus I have only taken those who gave a history either of an excessively prolonged labor or of instrumental delivery, and excluded those that may have been due to intrauterine causes from developmental defects or those acquired after birth from a multitude of causes such as trauma and meningitis. That there is a distinct relation between difficult or instrumental delivery to mental and physical defects that develop later was shown as early as 1861 by Little. Later, in 1885, Sarah McNutt showed that cerebral hemorrhage was the specific cause of a large number of the spastic paralysis developing soon after birth. Post-mortem examination in some of those cases showed distinct evidence of old hemorrhages with scar tissue formation.

Every possible variation, from a slight monoplegia with a little weakness of one extremity to a diplegia with extensive involvement of all four extremities could be seen among those unfortunates. Associated with the paralysis there was also every grade of mental impairment from slight mental backwardness to complete idiocy. The end results apparently depended upon the amount of injury to the brain as well as to the part of the brain involved.

A small hemorrhage in the motor area in the fissure of Rolando manifested itself by signs of spastic paralysis in the extremities while a much more profuse hemorrhage in a silent area hardly gave any evidence of its presence, except that the child seemed rather late in sitting up and walking. In some cases, no doubt, where the absorption was complete, there were no permanent after effects at all, and then the child is said to have "outgrown" it. The mental condition similarly varied according to the area involved. Extensive involvement of the frontal lobes gave marked signs of mental retardation, while a hemorrhage limited to the fissure of Rolando gave extensive spastic paralysis without any impairment of the mentality.

These unfortunates, large as their number is, represent, however, only a small part of all the cases of cerebral hemorrhage occurring in the new-born, as a result of trauma at birth. In addition to the large number of cases where this condition is not recognized because of the mildness of the symptoms, there is a still larger number of cases of cerebral hemorrhage of the newborn, and I believe that they constitute by far the vast majority, where the bleeding is of such magnitude as to result either in still births or in death in the first 24 or 48 hours. The relation of cerebral hemorrhage to still birth has been studied by various authors with various conclusions. Parrot in a series of thirty-four consecutive autopsies on still births gives the percentage of cerebral hemorrhage as high as 76%; Warwick gives 50% on a series of thirty-six cases; Beneke, on one hundred cases as 14%; and Wehe on a series of nine hundred and fifty cases as 13%. When we remember that about 4% to 5% of all births are still births we can realize how frequent cerebral hemorrhage occurs even if we should accept it to be the cause in only 13% of all cases.

It is true, of course, that not all cases of cerebral hemorrhage are due directly to trauma at labor. There are a great number of cases developing insidiously and not until several days after birth, causing symptoms of intracranial pressure, convulsions and death. Post-mortem examination will then show no demonstrable source of hemorrhage such as torn veins or injury to the sinuses; but in addition to the hemorrhage of the brain will also be found multiple bleedings throughout the body in localities where injury at birth could hardly have been the cause, in such places as the pericardium, peritoneum, and bronchial tubes. The etiology of these cases is undoubtedly, as Rodda[3] has demonstrated, a general hemorrhagic tendency with a delayed coagulation time and prolonged bleeding time. Comparatively mild trauma of normal labor may then be sufficient in itself to set up a massive hemorrhage large enough to cause death. In these cases trauma in labor often serves as the exciting cause, though the trauma need not be so great. The fact, however, remains that trauma at birth is a very important factor in the starting of the hemorrhage in a large number of cases.

The diagnosis in these cases is not very difficult. When an infant in the first few days of life becomes listless, pale, refuses the breast, and shows a slight facial oedema, we can suspect a probable cerebral hemorrhage. The onset of convulsions and nystagmus and bulging fontanels makes the diagnosis almost certain. To further establish the diagnosis a lumbar puncture is of considerable aid. If the hemorrhage is subtentorial and along the base or intraventricular the fluid will be bloody and thoroughly mixed with the spinal fluid. If the hemorrhage is confined to the convexity and is all above the tentorium the spinal fluid will be clear and then aspiration of the subdural space through a fontanel or a suture is of great importance, both as a means of diagnosis as well as a therapeutic measure. Differentiation from acute spinal affections is as a rule not hard if we study the distribution of the paralysis.

Here again it is very important to start treatment early. Muscle training and early treatment to prevent contractures will save a good deal of time and suffering. A promise that the child will outgrow it if given time is only too readily accepted by the parent and ought not to be given unless one is absolutely sure of his grounds.

Feeble-mindedness, with or without epilepsy, forms another large but rather indefinite group of cases who owe their orign to trauma at labor. Excluding all mentally retarded children who belong to distinct types, such as Mongolian idiocy, cretinism, and amaurotic family idiocy, and all unclassified cases without any apparent etiology, I have found sixty unfortunates who can trace their origin to birth trauma. They all gave a history of either difficult labor or the use of forceps; and physical examination showed some remains of spastic paralysis in one or more extremities. I say these unfortunates form rather an indefinite group because we cannot always exclude many prenatal causes and we can never say definitely whether any given case would not have been feeble-minded even in a normal delivery. Porter states that approximately 16% of all inmates of institutions for feeble-minded gives a history of a difficult labor.

A few miscellaneous cases complete my series. One is a case of musculo spiral paralysis following a fracture of the humerus. There was complete wrist drop, exactly as we see in so-called Saturday night paralysis of the pre-prohibition days. The trouble was caused by the involvement of the musculo spiral nerve in the callus,—as there was good motion in the wrist immediately after the fracture and the paralysis did not appear until the fragments formed a solid union.

Another is a case of facial paralysis. This was caused my the compression of the peripheral portion of the facial nerve by the blade of the forceps. In a proper application of forceps the blades, as I understand it, should not be in the vicinity of the facial nerve, but accidents do happen and the blades slip occasionally, even when the application is perfect at first. Sometimes there is facial paralysis, not from actual pressure of the forceps, but from compression of an extra vasation of blood in the region of the parotid. The reason for not seeing this condition more often in the clinic is not because of the rarity of the accident, but rather because the vast majority get well too quickly and before the mother gets ready to bring the child to the hospital the paralysis is all gone.

Still another very interesting case was one of complete flaccid paralysis of both lower extremities. Paralysis of the lower limbs due to obstetrical manipulation is very rare and a detailed report of this case will be of interest. As the lumbar and sacral plexuses are so well protected at every point of emergence from the spine and in their course through the gluteal and pelvic regions that they are not disturbed by any amount of manipulation or traction of the legs, the report of this case in detail may be interesting.

This was an infant six weeks of age. Family History—No miscarriages, no history of syphilis. Foetal movements were felt at six months and were rather vigorous immediately before birth. The delivery was done by the Braxon and Hicks manoeuvre because it was found that there was a placenta previa, and everything was well except that the nurse discovered that the child did not move the lower extremities.

Physical examination showed a well-developed and normal infant except for the lower extremities. There was complete flaccid paralysis of both lower extremities with loss of all the reflexes. The sphincter ani was relaxed and there was a complete loss of sensation, as high as the level of the umbilicus. In other words, there was paralysis corresponding to a lesion of the spinal cord at the level of the tenth dorsal vertebra. Upper extremitie were perfectly normal; no paralysis or weakness of any sort. No facial paralysis, fontanels not bulging, pupils equal and reacted normally to light and distance. X-ray examination of vertebra was negative.

The lesion here was, to my opinion, undoubtedly done by a tearing of the spinal cord at about the level of the tenth dorsal vertebra caused by a dislocation of the vertebra and the slipping of one vertebra over the other. Just what part of the manoeuvre caused the dislocation of the vertebra I am not ready to say. Whether it is the extreme force of the pulling or the process of doing the version I do not know. The x-ray examination was negative, because the vertebra slipped back in place after the damage was done.

A similar case was reported by F. H. Kooy in the *Journal of Nervous and Mental Diseases.* The child was born by version and extraction. At the age of two the child's legs were spastic and paretic but could be moved weakly. The reflexes were exaggerated, pain sense was diminished and thermal sense was lost. At the age of seven the legs were completely paralyzed, knee-jerks were diminished, and there was incontinence of feces and urine. The patient died at the age of eight and a half years from pyemia. At the post-mortem it was found that the cord was almost completely ruptured at the level of the ninth and tenth thoracic segments. We have had as yet no post-mortem examination in this case; but if we did, I believe we would find a similiar condition.

In summarizing, I just want to call your attention to the fact that in a series of 2000 consecutive neurological cases there were 101 cases of obstetrical paralysis whose cause we know to be trauma in labor and 63 cases of spastic paralysis, 60 cases of feeble-mindedness, and 24 miscellaneous, who in all probability owe their origin to birth injury. In other words, there were 266 cases in all, approximately 13%, where birth injury was the direct cause of the trouble. This number I believe to be rather a conservative estimate for if we include any of the doubtful cases we should have a much larger percentage. How many of these cases could have been prevented by more efficient obstetrics and more frequent resort to Caesarean section I am not ready to say.

Since most of the cases gave a history of unduly prolonged labor followed by the use of forceps it is impossible to say just what caused most of the damage,—the too prolonged pressure of the foetal head against the maternal soft parts, or the direct trauma of the forceps. Careful and wise interference is very likely the wisest course in the vast majority of cases, but let us remember that just a little extra pull or turn may add another hopeless cripple or idiot to the community, and let us remember, furthermore, that when there is damage done, not to add insult to injury by minimizing its effects but rather warn the parents and advise them to institute treatment immediately, before undesirable complications have set in.

REFERENCES.

[1] Boston Medical and Surgical Journal, Vol. clxxiv, p. 327. Amer Jour. of Med. Sci., July, 1907.

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# GOITRE—WITH AN ANALYSIS OF ONE HUNDRED OPERATED CASES.*

By A. M. Rowley, M.D., Hartford, Conn.

Of the glands that compose the endocrin system the thyroid, today, is perhaps the best understood, and working in harmony with the other ductless organs functionates efficiently to control the metabolism of the body, but when perverted in its action, causes a train of symptoms that has been studied by observers for nearly a century and one half.

William S. Halsted, in the Johns Hopkins Hospital report of 1920, has written a most exhaustive article upon the historical observations of goitre from the earliest writers down to the present day, including such surgeons as Hedenus, who, in 1821, successfully operated six goitres. Thence tracing the progress, by the observations and works of Victor Von Bruns, Theodorus Billroth, Von Mikulicz, Von Eiselsberg and through the time of Theodor Kocher, who did so much in the standardization of the operation upon the strumous gland, ending his paper with a description of the Halsted operation, which is, and will remain, a classical procedure of sub-total bilobectomy.

Goitre is not a common phenomena along the Atlantic Seaboard, which accounts for the relative rareness of cases treated by the Eastern physicians.

In the series of one hundred operated cases which I report for analysis, I found but one instance in which goitre in a child was correspondent to one in the parent; thus heredity in this locality seems to play a minor role in its production.

Many observers of today are explaining its etiology by association with some autogenous focal infection, but in this series I was unable to find any such correlation, although in several instances the association was present, and this particularly in the younger subjects. In several cases, tonsillectomies and other operative procedures were performed to rid the patient of any local infection without improvement, either in the size or symptoms resulting from an overactive thyroid.

There was no correlation between occupation and goitre, but this was apparent between sex and goitre; there being ninety-one females to nine males. The evidence of the intimate association of the thyroid gland with the reproductive organs of the female was very striking. It is not infrequent for hypertrophy of the gland at puberty, which produces the so-called goitre of adolescence, also the hypertrophy occasioned by pregnancy, when once begun, not to cease and the subsequent atrophy not to take place, leaving the gland abnormally large or over-active. In this series of cases, fourteen followed excessive hypertrophy at adolescence and eight at pregnancy; thus in these cases it is fair to presume, that the exciting cause of the over activity of the gland was due to some temporary change in the function of the reproductive organs, either in the ovaries or uterus, which must be considered as belonging to the endocrin system. What the association may be between these organs has not been, as I know, propounded, but it is evidently the call of one system upon the other to help keep the endocrin balance, and, as often happens, over stimulation leads to perversion and the result is an over active gland.

Five cases had lived for a considerable length of time in well known goitre districts. No

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etiology could be found in the remaining number.

The youngest of this series operated was a child of twelve and one-half. The oldest was sixty-six years of age. There were twenty in the teens, thirty-nine in the twenties, twenty-one in the thirties, fourteen in the forties, five in the fifties, and one in the sixties. The patient of twelve and one-half years was a Hebrew child. Her mother said, she had had a goitre since she was nine, that it was growing, and for the last year she had become quite nervous. The pathological report showed the gland to be of the parenchematous hyper-plastic type.

The oldest patient of sixty-six had an adenomatous toxic type. The average length of time for developing goitre was three years and nine months. The longest was twenty years. This gland was unilaterally enlarged from a large cyst. The shortest time was three months and of the exophthalmic type.

The varieties of goitre were forty-seven non-toxic and fifty-three toxic, eighteen being exophthalmic and thirty-five adenomatous. No tuberculous or carcinomatous goitres were met with in this series.

Seven goitres of the sub-sternal variety were found, all of them being associated with the enlargement of either one or the other lateral cervical lobes. Hoarseness, resulting from a partial paresis of either one or the other vocal cords, was present in only four per cent. of these cases, this percentage being relatively smaller than that reported from many of the larger clinics.

The various symptoms of the toxic patients were those referable to the eye, exophthalmos occurring in one-third of the cases, generally associated with the usual accompanying signs, Stellwag's, Von Graefe's, and others. Aschner's phenomenon, which is to me the most interesting of all, and consists of slowing of the pulse rate by pressure on the eyeballs, was observed in ten per cent. of the cases, gentle pressure immediately reducing the pulse rate from fifteen to twenty beats per minute. This symptom is accounted for by the hypertonicity of the sympathetic nerves acting through the vagus. It has been my observation that it can be elicited only when the patient is in an excitable condition, at which time the pulse rate is higher than the patient generally carries, and I have not been able to obtain it after a few days' rest in bed or after the administration of one of the sedatives. The local signs were hypertrophy in all cases, in some, however, quite slight. The nervous symptoms were mental, shown by irritability. Those referable to the sympathetic system, such as tremor and vasamotor disturbances of the skin, as flushing and hot flashing, and the vagal, tachycardia with palpitation during excitement or exercise and stomatic flatulency; secondary heart and kidney lesions were present in several of the long-standing toxemias. Loss of weight, due to increased metabolism was a constant symptom. Recently, attempts have been made to register the basal metabolism of toxemias. There is no question that when properly and carefully done, it is a refined method, and an almost exact one, of determining the status of the patient as regards his toxemia, also in questionable cases to differentiate the toxic type of thyroid from the focal infections. It should correspond, however, very closely to the clinical inventory when carefully taken.

Excitement and exercise are the two factors most prominent in producing rapid stimulation of the gland and it has been my observation that frequently, in cases where hyperthyroidism is not suspected, the pulse rate during the administration of ether shows a poor thyroid balance.

The treatment of this series of cases was ultimately operative. Medical treatment of the toxic variety should be preparatory to surgery. To condemn a young individual who has all the ambitions and desires of youth to forego most of the pleasures she should enjoy at her age, to lead a life of quietude, avoiding excitement and exercise and be under the care of an internist who constantly prescribes one of the many sedatives, is unjustifiable, when surgical interference in the early stage of the disease is a safe and curative treatment. Too much stress, however, cannot be laid on the pre-operative treatment and care of the toxic patients. Avoidance of excitement, and rest, that completely in a prone position, and at times quite prolonged, is very necessary, together with the use of sedatives, such as the bromides or small doses of luminol, which acts so charmingly with many patients. This is of great importance if the operative mortality is to be kept low; also much attention in the long standing toxic cases must be given to the improvement of the condition of the heart and kidneys, and only when the metabolic curve is at its lowest point should an operation be considered.

We have been liberal in the pre-operative use of morphine and atropin. A hypodermic is usually given immediately following the morning pre-operative enema, at which time the patient generally suspects that she is to be operated, especially so, if her breakfast has been omitted. A second hypodermic is generally given preceding her entrance to the operating room. In cases of bad heart lesions, either a severe valve leakage or myocarditis, with a high pulse rate, a post-operative auricular fibrillation may occur, as happened in two of our operative cases; here the preliminary treatment by one or two dram doses of a standard tincture of digitalis is of great importance.

My experience with the use of radium and the x-ray is limited. Some roentgenologists are reporting favorable results from exposure of the toxic cases as checked up by the caloric test. It is hoped that further experimentation will be carried on and that good results will follow. There is danger, in exposure to the rays, of producing a fibrosis or peri-capsular adhesions, which may handicap the operator if too long time elapses between the treatment and operation. It is a tendency of the surgeon to put too much burden upon the roentgenologist. Surgeons and physicians try radium generally as the last resort in terminal cases, and it is a wonder that it still has such a good repute. If it is found efficacious in lessening the toxemia in the very severe cases, it will be of great aid in the pre-operative treatment.

In this series, fifteen were ligated and subsequently had the more serious operation. All but one of these cases were ligated under novocaine, the other under ether. The average length of time between ligation and lobectomy was eight months plus. A very high overage, because of two waiting twenty-two and twenty-three months, respectively, during my absence from private practice. Leaving these two out, the average was four months. In all cases, bipolar ligation was done.

In the operation of lobectomy, as in many others, the question arises, what type of anaesthetic is the best to employ. I believe it is a controversy that will not be easily settled, but it is safe to say that novocaine, associated with morphine, when used in the hands of skillful operators, who have the entire confidence of their patients, is the safest. Ligation nearly always can be done under its influence, and much of the operation, and in some cases the entire operation, of bilobectomy. Generally, in the removal of the gland, the local anaesthetic has to be augmented, either with gas or with ether. The operative technique followed in this series was practically that used by Halsted, with the exception that, with a goitre of any considerable size, the muscles covering the gland were cut. This certainly makes for ease and rapidity at operation, and I have never seen any bad results follow their severance. Metal skin clips allow one to get a closer approximation of the skin edges, following a sub-cuticular platysma suture, than any other method of closure. The clips may be removed on the second day, and the result is a fine linear scar.

The amount of gland tissue removed must depend on its size and the degree of toxemia present. Just how much should be removed must, of necessity, be left to the judgment of the individual operator in each case.

In this series, one toxic case had a recurrence of symptoms and hypertrophy of the remaining tissue. In another, too much gland was removed and there was a thyroid privation. Small doses of thyroid have been administered to her over a period of two years and under its use she is perfectly well. The other case was re-operated and is now well.

It has been our custom to use rubber tissue drainage for the first twenty-four hours. Many of the cases have developed serum in the wound which had to be evacuated for a few days. In the sub-sternal type, prolonged drainage interferes with the healing of the cavity which must be by blood clot. In no case have we had a pyogenic infection of the wound.

The immediate post-operative treatment consisted in filling the circulation with fluids, encouraging the intake of water, especially if there was a post-operative toxemia. In our group, morphine and atropin were given for the first thirty-six hours; morphine lessens the desire to cough and, with atropin, tends to keep the laryngeal mucosa dry.

Post-operative complications have been, in two cases, pneumonia, one of an abortive type, the other of the true lobar eight-day type. It is of the utmost importance to exclude, in goitre cases, an acute nasal or upper respiratory infection before operating, because of this post-operative danger. Aphonia was observed in two cases, in one persisting for four months, the other clearing early. Two of our cases suffered from mild tetany, calcium was administered and both cleared.

The post-operative result was a morbidity of ten days, that being the average stay in the hospital, and from one to two months of rest in toxic cases, before they resume their vocation. The mortality was one per cent., or one case died in the series reported.

The operative results, in the toxic cases, were marked lowering of the pulse rate within two weeks following lobectomy, gradual increase of weight, and lessening of the exophthalmos and eye symptoms, the maximum benefit occurring at the end of one year. In only two cases of goitre in the last three years, were the symptoms of toxemia so advanced that no operative procedure for relief could be attempted. A small percentage of cases will have a recurrence of symptoms, because the surgeon under estimates the amount of gland to be removed, or the blood supply is not sufficiently shut off from the remaining tissue. These cases may be re-operated with safety, and they will be fewer and fewer, as the surgeon improves his technique, gains in experience at the operating table and in watching his operative results.

# ON THE SEVERELY BUT NOT TOTALLY DISABLED IN INDUSTRY, WITH SPECIAL REFERENCE TO THE ONE-ARMED.*

By Leo Eloesser, M.D., San Francisco, Calif.,
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An artisan or manual laborer who has suffered the loss of an arm is a type of the workman severely, but not totally disabled. The difficulties that arise in adjudicating his compensation apply to almost all severely but not totally incapacitated insurance carriers. The diminution of his wage-earning capacity will vary greatly, according to his occupation; its impairment will be in inverse ratio to his intelligence and energy.

A man whose calling requires no manual exertion or dexterity: a merchant, accountant, or lawyer, will not earn less because he has lost an arm. The more a man has to depend on the work of his two hands, rather than on his brain, for getting a living, the greater will be his loss.

Here we encounter the greatest difficulty in proper adjustment of compensation. To compensate a stock and bond salesman for the loss of an arm, when his injury diminishes his earning capacity not at all, is manifestly an economic injustice. It would be still more unfair to compensate an injured section hand, dependent entirely upon the use of his two arms, but earning a low wage, with a smaller sum than a high-salaried salesman, whose wage-earning capacity is unimpaired. This injustice is inherent to a system whereby the rate of compensation is based upon the wage alone, without taking into account the relation between the injured man's occupation and his injury.

The section hand who loses an arm is entirely incapacitated for manual labor. His intelligence is probably low; if it were not, he would not be a section hand. It is therefore unlikely that he will be able to shift to some other occupation calling for a higher order of intelligence. The only other courses left him are: to do nothing; to make a living as an object of semi-charity by selling papers or pencils; or to find a position as a watchman, a janitor, a messenger or a small shop-keeper, where his assets will be reliability and honesty. The salesman can continue to sell bonds at the same salary as before his injury.

The principles underlying the difference in compensation between the salesman and the section hand are inherent to our whole social system, where a man is penalized by poverty for defects of intellect he is born with, through no fault of his own. That we can change this seems unlikely. It is a law of the natural process of selection that the competent be rewarded and the incompetent suffer. Modern attempts to subvert this system by equalizing competency and shiftlessness seem mistaken efforts. It appears unjust, however, that a man who, through no fault of his own, cannot change his occupation to a self-sustaining one after his injury, should suffer financially to a much greater degree than the man whose intelligence will permit him to shift from one occupation to another with but little loss.

Two elements should enter into the rating of the injured: first, the nature of the injury; and second, the relation of the injury to the man's previous occupation and education.

It is evident that the permanent rating of each injury for each class of labor must be made on the injury rather than on the subsequent adaption of the injured to the new conditions imposed upon them by their infimities. Thus a farm hand with an amputation of the forearm should be rated at so and so many per cent.; a watchmaker with a permanent ulnar palsy at so and so many per cent., regardless of what their subsequent careers may be. Whether the farm hand learns banking and earns $50,000 a year, or whether the watchmaker turns vagabond and earns nothing at all, should make no difference in their rating. Derating the farm hand because he has had the energy to rise out of his former sphere, or increaing the pension of the watchmaker because of his laziness and shiftlessness, would be manifestly unwise. It would penalize the energy of the one and reward the incompetency of the other.

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* Read before the forty-ninth annual meeting of the Medical Society, State of California, Santa Barbara, May, 1920.

The pamphlet issued by the War Risk Insurance Bureau contains the following clause: "Increase or decrease in earnings of the ex-service men does *not* affect any compensation payments he may be receiving as long as the prior rated physical impairment continues." All accident commissions work on the same basis and rate their insured on the physical impairment due to injury.

The War Risk Bureau, does not recognize a second factor: the relation of the disability to the man's previous occupation and training. A man with a leg amputation is rated at 50%, whether he be a telegrapher, a mail clerk or a bank president.

A fair method of rating should specifically recognize this second factor and be based both upon the anatomical injury and the man's previous occupation. The table of disabilities should include in a vertical column a list of the more important injuries, in a horizontal line the more important occupations. In the resulting squares should be entered the percentage of disability for each injury and each occupation. A tabulation made according to this scheme is used by the California State Accident Commission.

The amputated falling under compensation acts may be divided roughly into four occupational classes:

1. The unskilled laborer.
2. The more or less skilled artisan.
3. The farmer and the highly specialized artisan.
4. Those whose occupations depend on brain work alone.

The problem of how to fit the maimed for the future, whether or not they should change their pursuits, and in what pursuits they should engage after injury, is one to which Army authorities have given much attention, in spite of the fact that the Army rating takes cognizance only of the injury and not of the occpation of the injured.

An amputated of the first class, an unskilled *laborer*, who depends solely upon manual strength for his living, will, of necessity, be barred from following his former occupation, no matter with what artificial appliance he may be fitted. Two courses are open to him: he may fit himself for a new pursuit in which he can dispense with the use of one hand, *i.e.*, one requiring the use of considerably more intelligence than in his old; or he may seek employment as a janitor, porter or watchman.

Whether to train the man for a new vocation will depend upon his native intelligence. It may be that lack of educational opportunity rather than an inborn stupidity, has forced him to stay in the ranks of unskilled labor. Opportunities for training should, therefor, be offered to all injured. Whether or not they be allowed to keep on with this training, however, should depend upon regular reports rendered by their instructors. The institutions to which they are sent should be public schools or state institutions, that there may be no financial temptation on the part of the school to keep up the training of worthless material. It it be evident, after a fair trial of vocational training, that a man is unfitted for the career for which he is being educated, training should be stopped.

A third course should be open to unskilled laborers: they should have the choice of land instead of money, under conditions specified later. A one-armed agriculturist, with or without a useful artificial arm, is in a position to maintain himself decently.

An amputated of the second class, a *skilled artisan*, will like the unskilled laborer, usually be forced into a new pursuit, not because he is totally unable to carry in his trade, but because he is unable to compete in point of time with an able-bodied worker, no matter how perfect the artificial appliance with which he is fitted.

It is common to find one-armed men who do practically everything that a two-armed man does. With practise, a one-armed man can do almost everything he has a mind to, but he can never do it as quickly as his two-armed competitor.

In most manoeuvres the artisan uses one hand as a motor, the other as a clamp, a vise, a steadier, or a guide. Thus, when driving a nail, one hand holds and guides the nail, the other wields the hammer. The one-amed man has to pick up nail and hammer together, and start the nail by holding the hammer in his fist and the nail between two fingers of the same hand. Once the nail has entered the wood and is steady, he shifts his hold on the hammer, grasps the handle and drives the nail home. The two-handed man starts the nail and drives it home without interruption, while the one handed man divides this act into two separate processes. The one-handed man will drive the nail just as well, but he will take at least twice as long, probably longer.

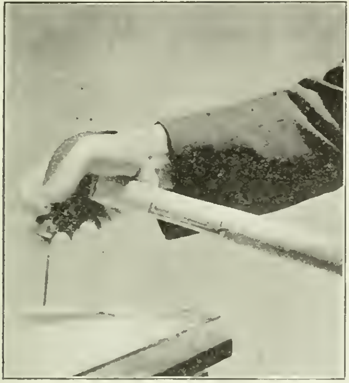

Fig. 1.—One-handed man's manner of driving a nail. Starting the nail.

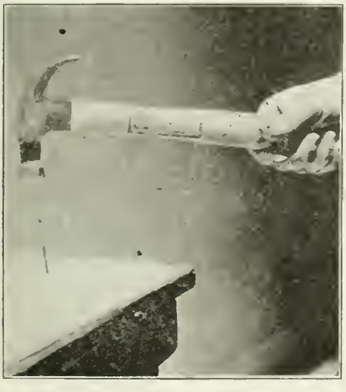

Fig. 2.—One-handed man's manner of driving a nail. Driving the nail.

Suppose he wears an appliance. Can he not guide the nail with the appliance? Yes; not as securely or readily as he can with his hand, but better than with no appliance at all. Granted that he could drive the nail almost as quickly, with the help of his artificial hand, as his two-armed fellow-workman. He has to pick the nail up out of a heap or from his pocket. This he will never do with an appliance. He will use his good hand to pick up the nail. He will transfer it to the appliance, and then proceed to drive the nail. If he is shingling or laying floors, he will lay, perhaps, one-half as much as his fellow. No contractor will employ him. His slowness will hold down the others on the job.

This is the crux of the whole situation—the time element. At the present high rate of wages, and with modern efficiency, no employer can afford a slow, skilled artisan, even at a low wage. He will not keep pace with others, and his unfinished tasks will keep other men waiting. The artisan has lost his job when he has lost his arm.

He has, however, not lost his training or the whole value of his experience. If he is skilled, well-trained, and possessed of the necessary moral qualities, he will make an ideal inspector, foreman, or employer. If he has risen above his trade and can make his head supplement his hands, his injury may not curtail his earnings but may, on the contrary, spur him on to efforts in a better paid field. The most profitable turn, then, for the one-handed artisan is to make an asset of his previous experience and training and to use it in overseeing, directing,

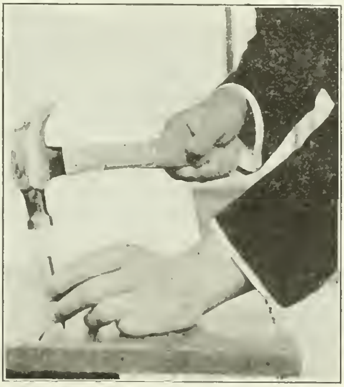

Fig. 3.—Normal manner of driving a nail.

or inspecting the work of others. He cannot go back to where he was. If he has not the intelligence and the moral qualities to combine with his training in rising above his trade, he will fall below it. He will either fill the ranks of those whose only assets are honesty and reliability—messengers, watchmen, janitors and porters, or, lacking both intelligence and reliability, he will drift into pensionage, vagabondage, laziness and, often enough, jail.

The education of the skilled artisan should recognize the value of his previous knowledge and experience: his new occupation should be built on his old one as a basis; add to it and supplement it, and not cast it aside. The workman, unless he is a mere beginner, should not be shifted by his training to an entirely new field. It is ordinarily unwise to try to make an advertising manager of an iron-worker who has lost one arm. He will do better as a supervisor, foreman, inspector, or, if he is taught accounting, as an office man in an iron works, than as a tyro in a field where his previous knowledge counts for nothing.

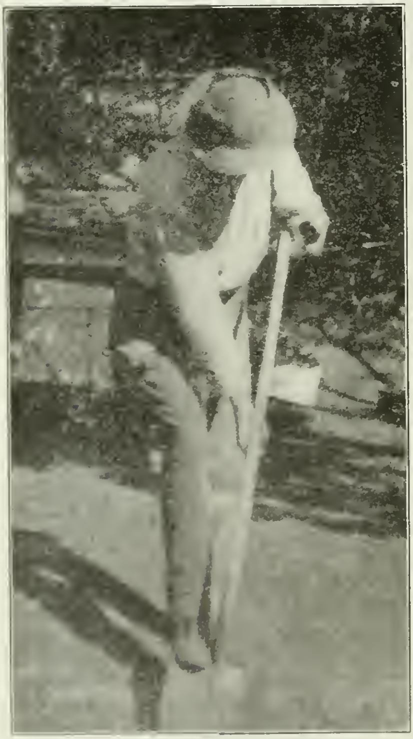

FIG. 4.—One-handed man using spade. This man has an amputation through the left forearm, and an amputation of the right thumb and forefinger. He uses no appliances and earns his living on a ranch.

These considerations apply to most artisans employed in more or less competitive production, in all large factories and enterprises where many hands are at work. Modern development of mass production has made room for one exception: more or less unskilled artisans, usually women or boys, employed strictly on one machine in turning out piece work. Such workmen are either beginners, or if older, of low intelligence. Either their stumps or the machines they tend can often be fitted with an attachment that makes it possible for them to continue their previous occupation. These human pendants to a machine, however, can scarcely be classed as skilled artisans.

Men of the third class, *farmers or highly speciaized artizians*, are skilled laborers, but their work is done under circumstances differ-

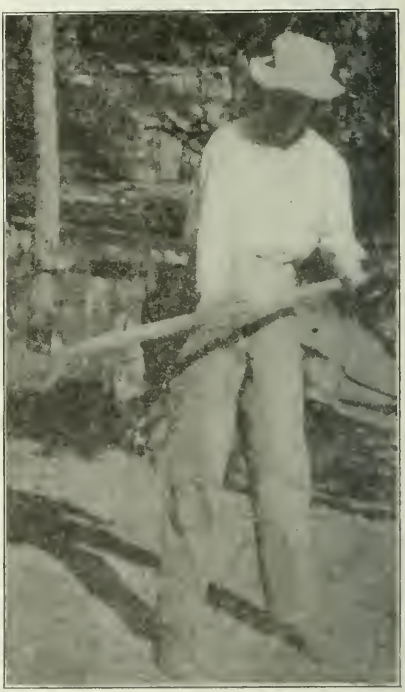

FIG. 5.—One-armed man using spade. (*Cf.* Fig. 4.)

ent to those governing a skilled workman in a large modern plant. A farmer can be almost or quite as successful with one arm as with two. He is not driven by competition in matters of piece production. If he takes longer to finish a job, no fellow-workman is kept waiting at his heels. He can dig, plow, feed stock and pick fruit, not very much more awkwardly, though more slowly, than his neighbors. The one-armed carpenter cited above may not be able to hold a job laying floors in a city skyscraper, but he can floor his farmhouse porch just as well as ever he could, even though it take 60 hours instead of 20.

Artizians in more or less highly specialized and skilled kinds of work, especially those in small shops, are not so much influenced by competition. A man who repairs dolls, or a man who sharpens microtome knives, or a skilled taxidermist, working with, permaps, one or two apprentices, will work more slowly with one arm than with two. His earning capacity will decrease: he will repair one doll, or sharpen one knife, or stuff one bird, where formerly he did two; but he will still hold his own at his old trade.

The farmer and the artizian engaged in a highly specialized and not over-crowded occupation (who works under much the same conditions as the farmer), will best remain at their old jobs. In none of them does the time element play a decisive rôle. The farmer who is fitted with a good artificial appliance can not only supervise farming operations, but he can personally carry on most of the work that need be done around the farm. The artisan who can do highly specialized work is not driven by the hurry of modern production to forsake his former calling.

A man in the fourth class, *intellectual labor*, will not require a change of employment, nor will his injury often reduce his wage-earning capacity. Compensation for such men should consist in payment of all hospital and medical expense, including proper appliances, and at this point I think compensation should cease. There is no economic reason why a one-armed salesman should be supported by the State. To offer him money is a feeble recompense for his suffering; to try to requite with money the deformity which he must carry throughout his life, is totally inadquate and unfitting. His own energy and bravery must make up for that.

The following table, furnished by the kindness of Dr. Harbaugh, of the California Industrial Accident Commission, illustrates occupations of the one-armed before and after injury. It bears out what has been said concerning the course of the various occupational classes after injury.

| | | |
|---|---|---|
| Total number of amputations with sufficient data | | 43 |
| (*a*) Laborers[*] | | |
| (*b*) More or less skilled artisans | | 33 |
| Changed to mercantile and office work | 10 | |
| Changed to watchmen, porters, etc. | 3[†] | |
| Changed to ranchers | 3 | |
| Did not change trade | 4[‡] | |
| Not working | 8[§] | |
| At school | 5 | |
| (*c*) Farmers and agricultural workers (No change of occupation) | | 5 |
| (*d*) Brain workers (No change of occupation) | | 5 |

Proper adjustment, then, of compensation for the one-armed and for other men who are severely but not totally disabled, is made on a basis containing two factors: the injury and the man's previous employment.

Men who are enabled by their intelligence, or by the nature of their pursuit, to continue in it with but small diminution of their wage-earning capacity should receive as compensation the best of medical attention. Men who by reason of stupidity or age are unable to find a pursuit in which they can support themselves, should receive compensation sufficient for them to live after their injury at least as well as before, perhaps better. Payment of compensation (except for the aged) should be made contingent upon the injured men doing some kind of work. If, however, they *do* work and earn a wage, no matter how small, compensation should make up the difference between their earnings before and after injury.

All severely injured should have opportunity to better themselves by vocational training. Their fitness for education should be determined by reports from unbiased instructors. If their progress warrant continuing their studies, they should receive compensation quite sufficient to maintain them during preparation for their new careers.

Men having a knowledge of agriculture should be induced to accept compensation in land instead of money. The land would best be given them on a five-year lease, to become theirs at the end of that time if they prove themselves competent to till it.

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[*] Data insufficient as to specific nature of employment.

[†] Two foreigners.

[‡] One continued to run a threshing machine as a stationary engineer, one truck driver, one paste machine tender, one chambermaid. None of these, except the paste machine tender, worked in large factories where speed played a part; the paste machine tender was merely a human pendant to a machine, collecting macaroni on trays.

[§] Half of these were over 50 years of age.

Payment of compensation to all classes of labor should be made contingent upon their engaging in some profitable occupation. If need be, the State itself should furnish employment. Opposition to the employment of cripples may be expected from supporters of the minimum wage laws and from labor unions.

It is not to be expected that employers will pay a cripple of one-half to two-thirds normal earning capacity a full union wage. However, difficulties arising from minimum wage laws and union labor standards might be met if the sum of the man's earnings, plus his compensation, be made to exceed the minimum wage and to come up to the union standard.

The type of appliance for the one-armed and the advisability of furnishing an appliance at all will depend upon the man's occupation, and the nature of his stump.

The one-armed soon learn to feed themselves, wash, dress, and help themselves at home and on the street without an appliance—most of them more readily without than with one. I have not been able to find out what peculiarities of person or mind determine whether the man will will use his appliance or go without. It seems to be a quite fortuitous matter. Some men wear an appliance for a time, then go without one; some go without one for a time, then wear one; some seem to alternate, swayed in turn by glowing representations of limb-makers, and disappointment in their promises.

Cumbersome or intricate and expensive appliances are not to be recommended. If the appliance be uncomfortable or get out of order easily, if it consist of a maze of gears and wheels that work with startling snaps and clicks, the injured will not wear it. Or he may disregard the complicated movements planned by its maker and use it merely as a steadier and guide, for which a simple wooden hand covered with a glove would serve him just as well.

Men with a high humerus amputation or a shoulder exarticulation, and men with long forearm stumps, will rarely wear an arm. A short humerus stump is not long enough nor strong enough to guide an appliance properly, and a long forearm stump is too useful as it is. It has tactile sensation, an attribute that no apparatus can supplant.

The best stumps to fit with appliances are long humerus stumps. The stump is long and strong enough to be really useful in guiding an artificial arm. The elbow fold is gone, so that the arm lacks a useful means of holding and gripping objects. A suitable appliance may supplant the lost elbow fairly well.

Brain workers will rarely wear an apparatus. Apparatus are failures cosmetically. An empty sleeve is scarcely more noticeable than a wooden arm.

Artizians and farmers will have most use for an appliance.

Arms have been made with innumerable attachments for special purposes. All of them have some sort of clutch into which various tools of trade and utensils of every-day life—forks, knives, brushes, etc.,—can be inserted. The clutch is a hindrance. It is worked with the sound hand, *i.e.,* the wearer must insert the tools into the clutch and tighten it with his good hand. But he can use his remaining hand to better advantage in doing something other

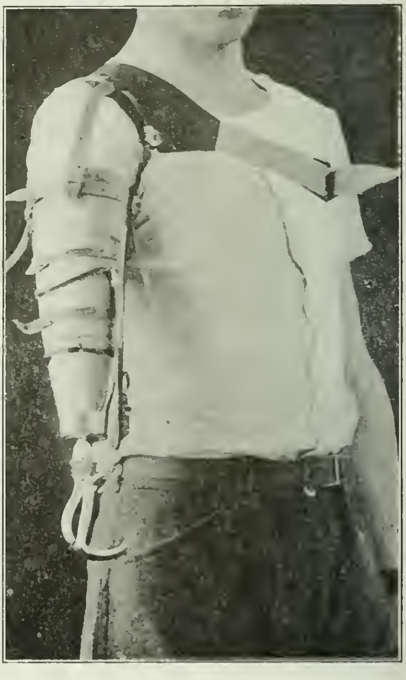

Fig. 6.—Universal hook for humerus amputations. No elbow joint. Especially adapted for heavy work.

than working his artificial arm. An appliance should be entirely controlled by the stump and shoulder, and leave the one remaining hand disengaged. Workmen doing piece work, who perform the same manoeuvre all day long and who, once they have inserted a special appliance into the clutch, could leave it there during their whole working hours without change, may be exceptions. They may find a clutch arm, with a few specialized instruments, useful. Most French and German arms work on this principle.

The most generally useful appliance is a hook or a ring. Dorrance, of San José, has invented a double hook whose jaws open at an angle of 45° so that the hook may be converted into a more or less closed ring. Objects may be grasped between the jaws of the hook and held firmly. The hook is opened by a strap leading to the opposite shoulder. It is shut by elastic bands slipped over its base. It is the most generally useful appliance that I know.

It may be of advantage (especially for farmers and artisans who need a strong arm) to make an apparatus for humerus amputations without an elbow joint, and to fit the hook directly to the end of the stump. Flexion is weak in an arm with a movable elbow; the elbow can only be held flexed against a strain by mechanically locking the joint. A mechanical lock, however, calls for control by means of the good hand. The arm can be made much stronger by doing away with the joint altogether and fastening the hook directly below the stump.

### CONCLUSIONS.

1. Compensation for the severely but not totally disabled, should be made on a combined basis of: (*a*) Physical impairment due to injury; (*b*) Previous occupation.
2. All severely injured should be given opportunity for vocational training.
3. The new career should utilize and be based upon the injured man's previous knowledge and experience.
4. Whether to continue training should depend upon the man's intelligence and fitness for a new career.
5. Training should be stopped if progress does not warrant its continuance.
6. Laborers trained in agriculture should be offered inducements to accept compensation in land instead of money.
7. Compensation should be contingent upon the injured engaging in profitable occupation.
8. Suitable employment should be furnished by the State, if necessary.

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## THE ADMINISTRATION OF ETHER BY AN INTRAVENOUS METHOD.

BY H. QUIMBY GALLUPE, M.D., BOSTON.

IN April, 1919, by arrangement with Dr. Robert C. Cochrane of the staff of the Boston City Hospital, it was possible to administer the first intravenous ether at that hospital.

It was thought best to use the method during a short operation on a type of patient taking ether with the most difficulty. A man sixty-six years of age with marked alcoholic habits, admitted for the cure of a right inguinal hernia, was chosen for the experiment. There were no definite rules, and no person with previous experience available. The following procedure was carried out with success.

Since ether is soluble in water, seven parts in a hundred, seventy cubic centimeters of ether were dissolved in about a liter of isotonic salt solution at room temperature. An ordinary glass burette, rubber tubing and canulla were boiled and the burette set up on a stand by the operating table at the right of the patient's head. The patient was then prepared for operation, and his right arm was also scrubbed with soap, water and alcohol. He had received no previous medication and his blood pressure was 130/90, pulse 78, temperature 98.4°. The right arm was draped with towels exposing the elbow, and under local anesthesia (½% novocaine) the median basillic vein was exposed. The burette was then filled with ether—salt solution and the solution allowed to run through the apparatus. The glass cock was closed. The vein was opened, the cock released, and the canula inserted into the vein. At first the solution was run in at the rate of five cubic centimeters per minute with no effect on the patient. The rate of flow was gradually increased to ten cubic centimeters per minute, during which time the patient became jocose, and the odor of ether could be detected on his breath. While the flow was being increased to fifteen cubic centimeters per minute, and when the method seemed a failure, the patient suddenly became unconscious, his respirations deep and regular, his muscles completely relaxed, and all other reflexes vanished excepting the final control of his pupil by the central nervous system. The flow was maintained at 15 c.c. per minute. The patient was draped and the operation begun. A Lumbard airway was inserted in the patient's mouth at this time. There had been no excitement, no marked rigidity, and not a movement by the patient since early in the administration.

During the operation, which lasted about twenty minutes, the rate of flow was changed several times. Any decrease from 15 c.c. per minute caused a rapid return of reflexes; any increase from 15 c.c. per minute produced shallow respiration, a rise in pulse, and a widely dilated pupil. As soon as the skin was sutured, the flow was stopped and the incision over the vein sutured. About 1200 c.c. of the solution had been used. Dressings having been applied, the patient was returned to the ether recovery ward on the operating floor. Within ten minutes after the ether had been discontinued the man was conscious and rational, and without nausea.

### CONCLUSIONS.

The method is without danger when controlled by one who understands the physiological effects of ether, and when used on a patient with a relatively low blood pressure.

The method should be of value in operations of short duration about the face and mouth, and in cases of shock where fluid given to the patient is essential.

Lack of ill effects during recovery make the method favorable from the paient's point of view. Of course, it is not necessary to expose the vein of the arm.

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The National Health Council, made up of The American Public Health Association, American Social Hygiene Association, National Committee Mental Hygiene, National Organization of Public Health Nursing, National Tuberculosis Association, National Child Health Organization, American Nurses Association, League for Nursing Education, and Bureau of Social Hygiene, will occupy rooms in the New Penn Terminal Building on Seventh Avenue, New York City, with a branch office of the United States Public Health Service.

## Book Reviews.

*A Synopsis of Medicine.* By Henry Letheby Tidy, M. A., M. D., B. Ch., F. R. C. P., New York: William Wood and Company. 1921.

"A Synopsis of Medicine" presents a very useful outline and summary of the most important principles of medicine. Diseases are classified and described, their symptoms enumerated, and their pathology explained. The book is divided into sections, dealing with specific infectious diseases, diseases due to physical agents, the intoxications, diseases of metabclism and of deficiency, and diseases of the digestive system, the respiratory system, kidney and urinary tract, the blood, the circulatory system, the dietless glands, and the nervous system, vasomotor and trophic disturbances, are considered, and also diseases of the muscles, joints and bones. Short summaries and special headings help greatly to facilitate the reading of so extensive a work. It is not intended that this book should take the place of a text-book; its purpose is to be of assistance to those who wish to review and revise their knowledge rapidly.

*Scurvy Past and Present.* By Alfred F. Hess, M. D., Philadelphia and London: J. B. Lippincott Company. 1920.

In view of the recent advances made in the study of scurvy and the scarcity of literature on this subject, this volume, "Scurvy Past and Present," is most opportune and welcome. In this book the author has revised the history of the disease and has presented the valuable data collected during seven years of investigation of scurvy, both in the laboratory and clinic. Various theories in regard to the etiology of scurvy are discussed. Detailed consideration is given to the pathology of the disease, its symptomatology and diagnosis, its prognosis and treatment. Valuable informtion is presented in chapters dealing with the antiscorbutic vitamine and antiscorbutic foods. Of considerable interest is the section describing aspects of experimental scurvy. Scurvy is considered in its relation to beriberi, pellagra, rickets, osteogenesis, imperfecta, osteomalaria, and other diseases. The book contains many excellent charts, diagrams plates and tables. The demand made by recent investigation of scurvy, especially as a result of experiences during the World War for a renewed consideration of this disease, has been met admirably by the publication of this excellent treatise of the subject.

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## THE RELATION OF THE EXPERT IN INTERNAL MEDICINE TO THE GENERAL PRACTITIONER.

"WHAT is going to happen to the General Practitioner? Is he going to disappear from the world entirely?" These questions are continually being raised by thoughtful laymen who find themselves bewildered by a world of medical specialism and do not know where to look for help. "Must we always go to specialists," they ask, "why can't we have the general practitioner who used to know how to take care of us when we were sick?" Of course, the answer is that they ought to consult the general practitioner. He is available and he always will be available, because he constitutes the one essential factor in the profession. The relatively prominent position occupied by the specialists today is due to their being a new development, and like all new developments, they monopolize a good deal of public attention. Meanwhile, however, the general practice of medicine goes on, improving gradually from year to year. Far from being rendered less important and by the creation of increasing numbers of special branches, the rôle of the general practitioner becomes, if anything, more important, for he must always be the medium of preserving a sound balance between them all. The real problem is thus, not what is to happen to the general practitioner in a world of specialists, but what is the position of the specialist in a world which centers round the general practitioner. The value of the specialist depends in the last analysis on what he can contribute to promote the efficiency of general medical practice.

From this point of view it is of interest to consider the relation of the expert in internal medicine to the general practitioner. Here is the field which lies closest to general practice and the one in which the general practitioner is usually most at home. Can he be substantially aided by the expert in this field and especially by the kind of expert that is now being produced? The type is changing.

A generation ago the clinician who was prominent in the field of purely medical disease achieved his standing only after many years of active general practice and hospital service. His position was based on an unusually broad clinical experience in which the opportunity for contact with a great variety of diseases offered in the wards of large hospitals often played an important part. He became an expert by virtue of the matured judgment which is developed by prolonged experience. He had followed the course of diseases from their inception to their termination and he had first-hand knowledge of prognosis and the effects of treatment. One could go to him with any unusual or obscure condition and he could always cite another similar case that he had seen years ago and had preserved in the vast storehouse of his memory. He had the foundations of the general practitioner, but had builded on them broadly and extensively. The expert in internal medicine at the present day, on the other hand, is tending to be of a different type. There is gradually arising a considerable group of men who aim from the outset of their career to become unusually proficient in one or more of the subdivisions of internal medicine and who enter the field as experts or consultants comparatively early in life. Their training has been intensive rather than extensive and has usually consisted of five to ten years devoted to intimate contact with disease in hospitals, to study of the fundamental sciences that bear on clinical medicine, and to scientific research. Prolonged residence in large hospitals has given them much clinical experience, but it is usually of a different kind from that of the general practitioner or the medical consultant of a generation ago. Their experience embraces a narrow field, but the field has been cultivated more deeply and they have brought to it all the enlightening contributions of modern science. This limitation of fields within the range of internal medicine itself has produced new specialties and we now have experts particularly skilled in infectious diseases, in heart disease, in renal, in pulmonary or gastrointestinal conditions. No one can master the details of the newer knowledge in all of the subjects or hope to keep pace with the rapidly advancing progress. The expert in a limited field within the bounds of internal medicine is a natural product of medical development. He is also, indeed, a product much to be desired, for on him depends largely the further advance of our knowledge. The question is, in what way can his specialized information be of use to the general practitioner.

The expert in internal medicine, can be of assistance to the general practitioner both in the diagnosis and treatment of disease. What he can offer of value in diagnosis depends in part on concentrated experience with limited groups of cases, and in part on his understanding of the use and interpretation of modern laboratory methods. The correlation of physics, chemistry, physiology, and biology, with medicine have produced many complicated but highly accurate diagnostic measures, the use of which involves so much time, experience, and financial outlay that they can never be adopted by the general practitioner. These methods are, indeed, often applicable to so small a group of patients that it would be economically wrong to attempt to make them a part of the armamentarium of the general physician. They must always be in the hands of men who are devoting themselves to the study of limited types of cases. The practical value in the care of patients, however, of the more accurate diagnosis afforded by such measures as electrocardiography, the determination of the basal metabolism, the chemical analysis of the blood, or the establishment of the type of infecting microörganism in infections of the respiratory tract, is undoubted. The expert in internal medicine, not only knows how to apply these tests, but he also knows which of the rapidly accumulating and often much heralded new tests are worth while applying in any given instance. He should serve as a clearing house for the general practitioner, telling him in what direction a case should be investigated and what particular measures are likely to throw light on the diagnostic problem. Good medicine does not consist in performing every diagnostic test, but in the proper selection of those which wise judgment indicates may be of value. In a similar manner, the expert in internal medicine may aid the general practitioner in problems of treatment. There are many therapeutic measures that have only a highly specific application. Experience in their use, and an understanding of where to use them can often be obtained by the man whose work is concentrated along certain lines and who sees a larger number of cases of some particular condition than falls to the lot of the general practitioner. Again, the critical judgment of the expert, based on his clinical experience and on his knowledge of underlying principles, enables him to differentiate between all the new therapeutic suggestions which are constantly being urged on the practitioner and to select those which logically and reasonably give promise of value. In diagnosis and treatment, the expert in internal medicine must act as the advance guard of the general practitioner, serving on the frontier between clinical medicine and the fundamental sciences, striving always to correlate the two, and to bring to the general practitioner the best fruits of his labors.

## THE MISSOURI BILL FOR THE REGISTRATION OF NURSES.

Miss Helen Wood, formerly of the Massachusetts General Hospital and the Massachusetts Board of Registration of Nurses, has forwarded the bill enacted into law in Missouri which she reports as the best law in the United States.

The important features of the law are:

Each member of the Board must be a registered nurse, a graduate of a school of nursing and have been a teacher in a school of nursing for at least one year.

A system of inspection of all schools of nursing and schools or classes for attendants, must be carried out.

Must appoint as secretary to the Board a registered nurse, who shall also be educational director and chief examiner, with salary to be determined by the board.

Members of the board shall be paid $10 per day for work done.

Two general classifications for nurses is arranged for. The graduate trained nurse with authority to use the title Registered Nurse, and four grades of nurses who are not graduates of training schools under the title of "licensed attendant."

Every registered nurse or licensed attendant shall also register with the county clerk.

Every registered nurse or licensed attendant must re-register every year—fee, $1.00.

The usual waivers are extended to those now registered and the full educational requirements of trained nurses do not go into effect until 1928, being graduated up to that time.

Exemption: Gratuitous nursing or care of the sick by friend or member of the family or nursing when done in connection with the practice of religious belief, or attendants in eleemosynary institutions of the state or of cities having a population of 30,000 inhabitants or more, and also exemption in event of a public emergency so pronounced by the state board of health. With these exceptions no one may practise as a trained nurse or licensed attendant in Missouri.

The board may grant provisional licenses to practise for a period not exceeding six months —fee, $5.00.

This is the most far reaching compulsory nursing law ever enacted. In Massachusetts, attempts have been made to establish some of the features of this law, but there has been opposition to all compulsory measures, and representatives of the training schools connected with the institutions for the insane, objected to the registration of attendants. The legislature evidently felt that in the presence of this opposition, it was wise not to adopt any of the bills presented.

Missouri has broken away from medical representation on the board of registration for nurses. This will bring up the question whether or not physicians are to relinquish all influence on questions relating to the curricula of training schools for nurses. While it is fully recognized that nursing has developed into a profession, there is room to question whether physicians may not have functions relating to the education of nurses. There is a growing suspicion on the part of some physicians that the work of some nurses is encroaching to an appreciable degree upon the legitimate work of the doctor, and hence it may be wise to retain the most cordial coöperation between these allied professions.

## "TWO BOTTLES A DAY TOO MUCH"

Under the above title, Mr. Volstead attempts to make the doctor a buffer between the opposing forces of prohibition and the opponents thereof, with the implication that if the present requirements do not work out well more stringent regulations may be imposed.

The whole prohibition scheme has placed such onerous burdens on doctors that they are quite generally disgusted with the law, and many absolutely refuse to take out licenses to prescribe alcoholic liquors. As in many attempts at legislation, the doctor is subjected to humiliating restrictions. A far simpler and less expensive requirement would have been to confer upon registered physicians the authority to prescribe as might be required, the government reserving the right to revoke permits whenever it could be shown that the intent of the law was not being complied with. At the present time, sixty-three per cent. of registered physicians have taken out licenses to prescribe alcoholic liquors.

It is claimed that amendments to the Volstead law are to be presented which will extend restriction further.

## MEDICAL NOTES.

The Public Health Service, Washington, D. C., proposes to conduct a general public health institute to take place during the fall of 1921; and to offer 25 to 30 courses, including the following: diagnosis and treatment of tuberculosis; nutrition in health and disease; sanitary engineering; clinic nursing and social work; clinic management; courses in syphilis and gonorrhea; mental hygiene; industrial hygiene; child hygiene; vital statistics; laboratory diagnosis; health centers; various courses in psychology and sociology.

The Institute faculty will be composed of 75 to 100 leading authorities, including William H. Welch, William H. Park, John A. Fordyce, Valeria H. Parker, John H. Stokes, Michael M. Davis, Jr., William H. White, Anna Garlin Spencer, Irving Fisher, C. V. Chapin, M. H. Rosenau.

The National Anesthesia Research Society held a special meeting at Columbus, Ohio, April 22, 1921. E. T. McKuson, of Toledo, was elected President and F. T. Franklinberg, 16 East Broad Street, Columbus, Ohio, Secretary. The Society publishes bulletins of interest to practitioners. Dr. Henry Edmund Gaston Boyle, O.B.E., representing the Royal Society of Medicine, London, and lecturer on Anesthetics to St. Bartholomew's Hospital, will attend the meeting May 31, at Niagara Falls.

Honorary Fellowships will be conferred on Drs. W. J. and C. H. Mayo, George Emerson Brewer, George W. Crile, Richard H. Harte, W. W. Keene, John M. T. Finney and A. J. Ochsner, by the Council of the Royal College of Surgeons of Ireland under a resolution adopted April 26, 1921. The ceremony will take place in the autumn.

Whitney Drug Control Act.—New York has found the ambulatory treatment of the drug addict to be a farce, according to Dr. S. Dana Hubbard. He characterizes the Whitney Drug Control Act as a most heinous regulation "which has bedeviled the entire profession of medicine and pharmacy." Apparently, the only logical method of dealing with the addict is to stop the distribution of drugs and treat the victims in properly equipped hospitals. Police powers may never be developed to the degree of great efficiency, but it is through these agencies that crimes must be diminished.

The Bulletin of Vital Statistics of the State Board of Health of Michigan publishes the statement that the rate of mortality for diseases and conditions associated with childbirth increased during 1920. Although it is stated in explanation that part of the increase in the maternal death rate was due to the accidents of pregnancy, the most unsatisfactory aspect of obstetrical statistics for insured wage earners was due to puerperal sepsis, the rate being 8.4 per 100,000. A slight increase in mortality from puerperal albuminuria and convulsions was also recorded. The better results obtained in Boston and New York City, through nursing service under expert supervision, is referred to.

House Bill No. 1571, which was proposed as an amendment to Section 27, Chapter 112, of the General Laws, provided that applicants for registration as physicians must be either citizens of the United States or aliens who had made primary declaration of intention to become a citizen thereof; and further provided, that aliens already registered should have certificates of registration revoked if, after seven years, citizenship had not been acquired, has been declared to be unconstitutional by the Attorney General of this Commonwealth. This settles a question which has been the occasion of some controversy, for in the past the useful effect of a law of this character was apparent in a few cases. The question of the propriety of the general application was always raised.

The National House has recently passed a bill to limit immigration of aliens in the United States to 3% of the number of foreign born persons of such nationality in the United States. This is substantially the same bill which was vetoed by President Wilson.

The American College of Surgeons, in conformity with its policy of organizing state branches, has established the Massachusetts Section of the Clinical Congress of The American College of Surgeons.

The first meeting of this Section will be held in Springfield on the thirteenth and fourteenth of May, inst.

An attractive program has been arranged. Morning sessions of both days will be given over to clinical exercises in the hospitals of Springfield. One of the afternoon sessions will be devoted to a consideration of a plan of the College with reference to Hospital Standardization. To this session the medical profession, all hospital managers, superintendents and other officials are invited. The other afternoon session will be devoted to scientific subjects of surgical importance. Three or four papers will be read.

There will be an evening meeting to which laymen will be invited. Addresses relating to the purpose of the College in improving hospital standards and facilities will be of interest to all who are interested in, or associated with, hospital organizations. This will be an especially valuable feature of these meetings and will bring forward the main object of hospital work, which is service for the people.

First Smallpox Death.—Buffalo has just had its first death from smallpox in ten years. Alton Miller, age 20 years, single, white, came from Teness, Ill., had never been vaccinated and became ill soon after his arrival in this city; coming from a territory at present filled with smallpox. He died March 7.

In 1919 New York State had 191 cases of smallpox. In the same year Michigan had 2460 cases. New York has three times as many people as Michigan. In proportion to population, for every case in New York there were 39 in Michigan. From 1914 to 1918 there were 18 cases in Michigan to every one in New York. New York is a vaccination state; Michigan is not.—*Buffalo Sanitary Bulletin.*

The Nation's Health.—With the May issue the name of this magazine will be changed from *Modern Medicine* to the *Nation's Health.* This is being done to make the title more clearly descriptive of the present scope and the new and greatly enlarged service of the magazine in health promotion and conservation.

The change is one which has been under consideration for some time. It is the final step in the development of a magazine which we confidently expect will be of distinctive service to those who are in positions of responsibility for the nation's greatest asset, the health of its citizens.

The change of name and the broadening of its field of endeavor complete the transformation of the *Interstate Medical Journal,* the predecessor of *Modern Medicine,* from a publication devoted to clinical medicine, to a health magazine of broad national service—a magazine devoted to community, industrial and institutional health problems.

The *Nation's Health* will continue those features which have proved most interesting and serviceable to the readers of *Modern Medicine,* but will cover the subjects treated more completely and in addition inaugurate other features which are important in the new and wider field.

The Eyesight Conservation Council was convened Tuesday, February first at the Biltmore Hotel. An address was given by Dr. Thomas D. Wood of Teachers' College, Columbia University. The subject of defective vision was discussed by Dr. Cassius D. Westcott, Mr. R. C. Auguston, Mr. Bailey A. Burrett. The important assertion was that accuracy of vision has a vital relationship to integrity or obliquity, both in the fields of vision and morals, that not more than one-third of the 24,000,000 school children in the United States receive adequate test of vision and that not more than one-third of those tested have defects of vision adequately corrected, that loss of efficiency due to defective vision is of great economic importance, and that ninety per cent. of school children's eyes are imperfect. The suggested remedy was to have a demonstration of the benefit resulting from intensive study and the application of remedial measures in some representative school and the results placed before all school authorities.

## BOSTON AND MASSACHUSETTS.

A Staff Clinical Meeting was held in the lower Out-Patient Amphitheatre, Massachusetts General Hospital, Monday, May 2, 1921, at 8 p.m. Program: "Report on Neurological Surgery," Dr. W. J. Mixter, Dr. George Clymer. Dr. C. A. Porter presided. Doctors, nurses and medical students attended.

Dr. Louisa P. Tingley, of Boston, read a paper entitled, "Lighting in the Medical, Dental and Ophthalmological Field," before the Illuminating Engineering Society, in New York, on April 14, 1921.

Registration of Nurses.—At the last meeting of the New England Surgical Society, the following resolution was passed: That the New England Surgical Society, realizing the scarcity of nurses in hospitals and private practice, believe that the situation can be improved by the modification of the requirements for the registration of nurses.

The Board of Registration in Medicine revoked the certificates of registration on April 29, ult., of J. Washington Hill and Thomas E. Walsh, and suspended the registration of Domizio a Costa for one month.

The Bill permitting towns to expend more than $2,000 for nurses has been made an emergency measure and has passed the Senate and House. It will therefore take effect immediately.

Take Notice: The meetings of the A. M. A. are only open to members in good standing. All members of the Massachusetts Medical Society who desire to participate in the exercises should pay the annual dues at once.

Dr. Morton Prince read a paper entitled "The Production of Hallucinating Phenomena," at a stated meeting of the New York Academy of Medicine May 5, 1921.

## NEWS FROM DISTRICT SOCIETIES.

At the annual meeting of the Suffolk District Medical Society, held April 27, Dr. John Homans read a paper entitled, "Symptomatology and Operability of Cancer of the Large Intestine According to Its Location." The following officers were elected: President, F. B. Lund, M.D.; Vice-President, J. W. Bartol, M.D.; Secretary, R. H. Miller, M.D.; Treasurer, D. J. Bristol, M.D.; Commissioner of Trials, Channing Frothingham, Jr., M.D.; Councillor for Nominating Committee, W. C. Howe, M.D.; Alternate, W. H. Robey, Jr., M.D.; Librarian, W. P. Coues, M.D.; Committee on Supervision, A. L. Chute, M.D., F. W. Stuart, M.D.; Committee on Social Meetings, J. M. Gallison, M.D.; H. F. Day, M.D.; A. A. Hornor, M.D.; A. W. Allen, M.D.; Censors, C. M. Smith, M.D.; G. B. Fenwick, M.D.; T. J. O'Brien; J. S. Stone, M.D.; R. H. Vose, M.D.; Councillors, J. L. Ames, M.D.; S. H. Ayer, M.D.; J. W. Bartol, M.D.; V. Y. Bowditch, M.D.; R. Bonney, M.D.; J. T. Bottomley, M.D.; E. G. Brackett, M.D.; J. E. Briggs, M.D.; F. J. Cotton, M.D.; E. G. Crockett, M.D.; L. J. Cummins, M.D.; L. Davis, M.D.; C. Frothingham, M.D.; W. J. Gallivan, M.D.; J. E. Goldthwaite, M.D.; G. S. Hill, M.D.; W. C. Howe, M.D.; J. C. Hubbard, M.D.; H. Jackson, M.D.; D. F. Jones, M.D.; E. A. Locke, M.D.; F. T. Lord, M.D.; F. B. Lund, M.D.; B. H. Metcalf, M.D.; R. H. Miller, M.D.; J. J. Minot, M.D.; F. S. Newell, M.D.; E. H. Nichols, M.D.; B. W. Pond, M.D.; E. Reynolds, M.D.; W. H. Robey, Jr., M.D.; S. Rushmore, M.D.; D. D. Scannell, M.D.; C. L. Scudder, M.D.; C. M. Smith, M.D.; M. Standish, M.D.; J. S. Stone, M.D.; E. W. Taylor,, M.D.; L. P. Tingley, M.D.; F. H. Williams, M.D.

G. W. Brewster, M.D., *Chrm.*
H. B. Loder, M.D.
J. W. Cummin, M.D.
R. L. DeNormandie, M.D.
A. H. Crosbie, M.D.
*Nominating Committee.*

The Berkshire District Medical Society held its annual meeting in North Adams, April 27, at which Dr. Walter E. Fernald, of Waverly, gave an extremely interesting talk on "The Feeble-Minded Child." The following officers were elected for the ensuing year: Dr. George H. Thompson, of North Adams, President; Dr. M. H. Walker, Jr., Secretary; and Dr. Charles T. Leslie, Treasurer; the Councillors being the President, Dr. Henry Colt, and Dr. B. W. Paddock, Dr. P. J. Sullivan, of Dalton, and Dr. A. P. Merrill.

The popularity of Dr. Frederick T. Lord's lectures in the Worcester Extension Course of the Harvard Graduate School of Medicine has been such as to make possible five extra lectures, arranged as follows: April 27, "Industrial Medicine" (illustrated), Dr. Harry Linenthal; May 4, "Industrial Medicine," Dr. Wade Wright; May 11, "Pediatrics," Dr. Lewis W. Hill; May 18, "Diabetes," Dr. Elliott P. Joslin; May 25, "Asthma," Dr. I. Chandler Walker. These lectures, held, as the others, in the King Street building of the Worcester City Hospital.

Dr. Charles L. Nichols has resigned from the presidency of the Worcester Associated Charities in order to devote more of his time to the larger field as president of the Worcester Welfare Association, which includes some thirty of the charitable organizations of the city.

The annual meeting of the Franklin District Medical Society was held May 10, 1921, at 6.30 p.m., at the Mansion House, Greenfield. Papers were read under the titles, "Broncho-pneumonia in Young Children," by Dr. H. N. Horn, and "Encephalitis Lethargica," by Dr. A. Johnson,

## Miscellany.

### THE SO-CALLED CURE FOR TUBERCULOSIS.

Dr. John B. Hawes, 2nd, recently elected President of the Boston Tuberculosis Association, writes as follows, concerning the new cure for tuberculosis, and claims made for it by its inventor, Dr. Henry Spahlinger, of Switzerland:

"There has been considerable notice made in the public press of Europe and of this country, and likewise in the medical journals, concerning a so-called remedy for tuberculosis recently discovered by Dr. Henry Spahlinger, a Swiss bacteriologist. This alleged discovery is a product made from the bodies of the germs of tuberculosis, to which attention was first called in 1892 by the late Robert Koch, of Berlin. Although, at that time, Dr. Koch's claims for it were not excessive, it was looked upon, however, as a cure for consumption with the result that countless tragedies were caused. Tuberculin as a therapeutic agent fell into disrepute for many years afterwards, although at Saranac Lake and elsewhere, by men of the school of Dr. Edward L. Trudeau, experiments as to its efficacy were being carried on. It was again called to the attention of the world by Dr. Friedman, a German bacteriologist, who claimed to have discovered, with a turtle serum, a real cure for tuberculosis. His serum was nothing more than another form of tuberculin made from a mild strain of tubercle bacillus as found in cold blooded animals. Our experience in this State with Dr. Friedman's "turtle soup," as it came to be called, is too vivid and, to many, too bitter to need further comment, and now once more, Dr. Spahlinger has introduced a form of tuberculin for which somewhat extravagant claims are made.

The Boston Tuberculosis Association would urge most seriously that the public put absolutely no faith in this so-called cure for tuberculosis, as it stands at present. Only after it has been given a careful and painstaking trial in the hands of scientists, at our best medical schools, sanatoria and hospitals, such as the Rockefeller Institute, the Harvard Medical School, and the Saranac Lake Laboratory, will we be in a position to judge as to its efficacy. The tragic results following the Friedman episode, which are still fresh in our minds, must not be duplicated. A sane and sound skepticism should be the attitude of everyone of us in this regard.

### RESOLUTIONS ON THE DEATH OF DR. WILLIAM FISKE WHITNEY.

The Obstetrical Society of Boston records its sense of great loss in the death of Dr. William Fiske Whitney. A member of the Society since April 19, 1898, he was most constant in attendance and most devoted to its interests.

Always ready to take helpful part in the discussion of papers presented, and in the friendly good fellowship in the meetings, he will be long remembered and his loss keenly felt by the members of the Society.

A pioneer in his special line of work, an invaluable aid to a generation of surgeons and obstetricians, he made countless patients his unknown debtors. As curator and upbuilder of a great museum, he was the friend and helper of hundreds of students.

It is not easy, under present conditions, to appreciate the true value of a man so unassuming; yet he was honored, respected and beloved alike in school and hospital, and especially in this Society, because of his useful service so modestly rendered, and because of his friendly interest in our welfare.

Alfred Worcester,
J. S. Stone,
*Committee.*

## Correspondence.

### NON-RESIDENT MEMBERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Philadelphia, April 27, 1921.

*Mr. Editor:—*

I wish to commend the suggestion made in a recent number of the Journal in regard to the burden carried by non-resident members of the Society.

Many of us, who are living in places remote from New England, but who wish to retain our membership in the Society because of former associations, and who also desire to continue our subscription to the Journal, feel that some plan should be devised whereby we could enjoy non-resident privileges of the Society.

In this regard, I would like to suggest that the Society adopt a plan similar to that in vogue in the local medical societies of Pennsylvania, whereby non-resident members pay one half the dues required from resident members.

Yours very truly,
Albert S. Hyman, M.D.,
Superintendent, Mt. Sinai Hospital, Philadelphia.

### LIABILITY INSURANCE FOR DOCTORS BY THE MASSACHUSETTS MEDICAL SOCIETY.

Springfield, Mass., April 28, 1921.

*Mr. Editor:—*

Your editorial of April 21, on Malpractice Liability Insurance, deserves a reply. The reason that so many physicians have taken out this insurance is perfectly obvious in view of the fact that, although The Massachusetts Medical Society provides a lawyer to defend us, it bows itself out of any responsibility for the verdict.

It is, perhaps, true, that the Society wins as many of its cases as the insurance companies, but the fact that the cases lost are increasing is at the bottom of this increase in rates.

Under these circumstances, I do not see how we can afford to leave to The Massachusetts Medical Society the protection of our interests.

I see no reason, however, why the Society should not form a mutual protective company and issue real protection to its members at far less cost than we have to pay now, since we are now not only paying for our own protection, but are also paying for the protection of every charlatan in the state.

Very truly yours,
Eoline C. Dubois, M.D.

## NEWBURYPORT MEDICAL CLUB DEPLORES PASSING OF ANTI-VACCINATION BILL BY THE SENATE.

*Mr. Editor:—*

On Monday, April 4, 1921, the Massachusetts Senate passed, to be sent to the House, a bill which practically means that compulsory vaccination against smallpox be abolished.

All intelligent people know that the present comparative immunity to smallpox enjoyed by the world is the direct result of vaccination.

To be sure, we occasionally have smallpox, but it invariably arises among the unvaccinated.

Where vaccination has been allowed to lapse, just as soon as smallpox develops, an epidemic is inevitable.

The misguided, meddlesome, would-be reformers who protest against vaccination do not know, or refuse to realize, the great danger courted by omitting vaccination. This ignorance of, or refusal to acknowledge, well established scientific facts is based partly on the present immunity, which is the result of previous years of vaccination.

The Newburyport Medical Club wishes to place itself on record as firmly opposed to the passage of any bill which will lower the general public health, as this one of April fourth must do.

Furthermore, the Newburyport Medical Club regrets that its own state senator should have been so unwise as to have voted in favor of this bill.

Arthur J. Hewett, *Secretary*,
Newburyport Medical Club.

## A CORRECTION.

Boston, Mass, May 6, 1921.

*Mr. Editor:—*

I understand that of late my name has been used in connection with the financing of the so-called Hospital Corporation. Will you be good enough to publish in the Journal the fact that I have no connection, financially or otherwise, with that concern?

Very sincerely,
John T. Bottomley.

## EARLY REGISTRATION URGED.

Registration booth for the annual session of the American Medical Association will be open at 9 o'clock on Monday, June the sixth. It is expected that the greater part of the Boston profession and a considerable proportion of the profession of New England will register on this day in order to relieve the congestion which is sure to occur on the following days of the session.

Yours very truly,
A. S. Legg.

## NOTICES.

### EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold an examination in Boston, June 14 to 21, inclusive.

Subjects: Anatomy, Clinical Physiology, Physiological Chemistry, Pathology, Bacteriology, Materia Medica and Therapeutics, Medicine, Surgery, Obstetrics and Gynecology, Hygiene and Sanitation. The certificate of the National Board is accepted as equivalent to a professional examination by the Federal Services and a large majority of State Medical Examining Boards.

Eligibility for examination: A four-year high school course, two years of acceptable college work, including physics, chemistry, biology and a modern foreign language; graduation from a Class A medical school, and one year as interne in an acceptable hospital or laboratory; application for examination will be considered from interne who had completed at least six months of interne service.

Applications should be made before May 25, to allow for proper investigation of credentials.

Information and application forms may be obtained from Dr. Horace D. Arnold, 520 Commonwealth Avenue, Boston. Dr. Arnold may be seen at his office from 4 to 5, Mondays, Wednesdays and Fridays, until May 25, or by appointment.

Boston Association of Cardiac Clinics.—Dr. Robert H. Halsey of New York, Secretary of the Association for Prevention and Relief of Heart Disease, will give an address in the Amphitheatre of the Boston City Hospital, Friday, May 20, 1921, at 8.15 o'clock. His subject will be "Work of the New York Association of Cardiac Clinics."

The meeting has been arranged by a committee of the Boston Association of Cardiac Clinics. All physicians and social service workers interested in the problem of heart disease, are invited.

William H. Robey, M.D., *Chairman*,
P. D. White, M.D., *Secretary*,
George P. Denney, M.D.,
Wiliam D. Reid, M.D.,
Paul W. Emerson, M.D.,
Richard S. Eustis, M.D.,
Burton E. Hamilton, M.D.

Boston City Hospital.—Staff Clinical Meeting, Cheever Surgical Amphitheatre, Friday, May 27, 1921, at 8.15 p.m.

1. Some Aspects of the Functional Pathology of Lobar Pneumonia. Speakers: Thomas E. Buckman, M.D., 15 minutes; F. Dennette Adams, M.D., 10 minutes; Harold T. Edwards, M.D., 10 minutes. Discussed by James Means, M.D.
2. Studies in Cutaneous Reactions in Pneumonia. Speaker: George H. Bigelow, M.D., 15 minutes.
3. Studies in Immunity in Pneumonia. Speakers: W. L. Moss, M.D., and L. H. Ferguson, M.D., 15 minutes.
4. Studies in Pneumonia in Children. Speaker: Arthur B. Lyon, M.D., 10 minutes.

Physicians and medical students invited. Open discussion. Dr. Edwin A. Locke will preside.

Dr. H. Archibald Nissen,
Dr. Halsey B. Loder,
*Committee.*

Beth Israel Hospital.—There will be a clinical meeting in the auditorium of the Beth Israel Hospital on Wednesday evening, May 11, at 8.15.

PROGRAM

Lung Abscess. Dr. Wyman Whittemore.

Discussion. Dr. E. A. Locke, Dr. L. M. Freedman, Dr. S. A. Robins.

Physicians are cordially invited. The telephone is Roxbury 5940 and visitors may be on call.

E. Granville Crabtree, M.D., *Secretary.*

The Boston Medical and Surgical Journal

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# Original Articles.

## THE ESSENTIAL FACTORS OF CANCER CAUSATION.

BY JAMES W. SHANNON, M.B., SAN DIEGO, CALIFORNIA.

BEFORE we can be in a position to understand the reasons for cancerous growth, or to deal intelligently with the subject of its treatment or prevention, we must study it, not from the limited viewpoint of clinical or experimental investigation, but in the broadest manner possible, namely, as a natural phenomenon.

All phenomena result from the action of an appropriate form of energy upon a suitable kind of material under fitting conditions, and if we are careful to avoid the error, often committed by thoughtless persons, of confusing the causes of phenomena with the conditions under which they arise, we shall, having once acquired a correct idea of the nature of any phenomenon, have no difficulty in gaining an insight into its cause. In other words, it may be said that a correct understanding of the character of a phenomenon implies a knowledge of the kind of energy or activity which caused it. We do not suppose, for example, that growth in a plant or animal could be *caused* by chemical action, heat, electricity, or, in short, by any kind of stimulus other than that which we recognize as vital energy or vitality, though from every-day experience we can hardly fail to realize that, *after* a plant or animal is brought into being, chemical action, heat, and other forms of physical energy contribute towards its growth and development, and, in fact, are a most important part of the conditions necessary for the continuance of its existence.

Fortunately for our studies there is no dispute concerning the nature of cancer, but on the contrary, so fully are all who are qualified to judge of it convinced that cancerous disease is a manifestation of growth, that in text-books and other medical writings the term "*malignant new growth*" is most commonly used to distinguish it from other, and less serious, varieties of tumor. If, then, the nature of cancer is that of growth, it is clear that its manifestations belong to the order of vital phenomena, and until it can be proved that vital phenomena have ever arisen, or ever can arise, from the action of any form of physical force, we have no choice but to believe that, in common with all kinds of growth, normal or abnormal, healthy or otherwise, cancerous growth is due to one funadmental cause only, namely, vital energy. Hence, while we may recognize many kinds of physical action as being a part of the *conditions* under which cancerous phenomena manifest themselves, yet in seeking for the cause of cancer we cannot hope to be successful unless we study the problem in the light of the knowledge of vital phenomena which is available to us.

In the simplest form of animal life an individual consists of a single cell of microscopic size, and because of its primitive character, it might seem that there is nothing in common between it and such a highly organized animal as a human being; but exactly the reverse is true. Not only are highly organized animals composed of the same kind of material (protoplasm) as those of the simplest type, but the active and characteristic elements of their organs and tissues are cells, which (though living in a special environment and differing, in some cases, but not in all, from single-celled organisms in shape and other minor particulars), from a biological standpoint, may be, and are, regarded as identical, in all fundamental respects, with the most primitive form of animal life, namely, protozoal organisms. In short, it may be said that whereas an animal of the most primitive type consists of one cell only, an animal of an advanced type is composed of an enormous number of essentially similar cells in combination, each of which, notwithstanding that it is a part of a complex individual, is. nevertheless, to be regarded as a biological entity. Furthermore, there is no function necessary to its existence or to the continuation of its species, performed by the most highly organized being which is not equally well performed by the most primitive organism; but what the former does on a large scale, the latter does in miniature. Thus, for example, according to their respective requirements, the processes of respiration, digestion, assimilation, secretion, excretion, reproduction, and reaction to environmental conditions, are carried on in the case of a single-celled individual, not less perfectly and in a manner virtually identical with the same functions in the case of individuals of the most complex type. Whatever difference there may be between the extremes of animal life, therefore, is certainly not one of nature, quality, substance or function, but of degree only.

A cancerous formation, similarly to other manifestations of life, consists of cells, but the cells of every cancer are not alike; *they vary in accordance with the character of the cells in the organs and tissues of the body, and are always identical in type with the cells present at the seat of origin of the disease.* Thus, for example, the cells of a skin-cancer are identical with the normal cells of the skin, of a breast-cancer with those normal to the breast, of a stomach-cancer with those normal to the stomach, and so on in respect to every organ or tissue which is the primary seat of cancerous disease. In connection with this part of the subject it is worthy of notice that while there is a type of cancer-cell to correspond with every important organ or tissue, yet there are two notable exceptions, namely, the brain and the voluntary muscles. Cancer has never been known to *originate* in the cells of the brain or in the cells of those muscles which are under the control of the will, and moreover, cells having the character of those in the brain or voluntary muscles have never been found in any cancerous growth. The fact that the brain and voluntary muscles are immune from cancer is of the greatest significance when the reasons for it are understood; but they are somewhat too technical for discussion at the present time. The freedom of the brain and voluntary muscles from cancer is, however, perfectly consistent with the absence from neoplastic formations of cells having the characters of brain cells or voluntary muscle-cells, and also with the rule that the cells of every cancer correspond in type with the cells of the organ or tissue in which it originated.

The growth of every living thing, whether of simple or complex individuals as a whole or the organs and tissues thereof, is the result not of enlargement, but of an increase in the number of the cells of which they are constituted. With certain exceptions (chiefly nerve-cells and voluntary muscle-cells) it may be said that the cells of every organ and tissue of the body have the power to reproduce themselves by a process of simple division, but special attention should be given to the fact that *the offspring is always of the same type or species as its parent cell.* If this were not so, the existing uniform arrangement of species would disappear.

*Cancer cells reproduce themselves in the same manner and by the same process as the normal cells of the body,* but with the difference that whereas the growth of normal cells proceeds in accordance with a preordained plan and is controlled with a view to the structural and functional requirements of the body, the growth of cancer cells is excessive, irregular, disorderly, destructive, and progresses at the expense of the body and independently of its controlling mechanism. Notwithstanding the evil character of cancerous growth, it should never be forgotten that just as there is no fundamental difference between the most vicious criminal and the most virtuous person, so in like manner there is no difference between cancerous and normal growth.

Inasmuch, then, as cancer cells are identical in type with the normal cells of the tissues or organs which are the primary seat of cancerous disease, and that tissue cells cannot reproduce any kind or species other than their own, it follows that *cancer cells are the offspring of, and belong to the same species as the cells of the tissue or organ in which they originated.* Having regard, then, to the excessive character of the growth of cancer cells, and to the fact that growth implies vital energy or vigor, we are forced to conclude that cancer cells are tissue cells endowed with a supernormal degree of vitality. Having regard, furthermore, to the fact that in the beginning every cancerous growth is of microscopic size, the problem resolves itself into the question, how, or by what kind of stimulus are the normal cells of a minute portion of an organ or tissue caused to depart from the regular course of their development, and to reproduce themselves in excess of the requirements of the body? To this only one answer is possible,—*the stimulus of fertilization.*

Fertilization, or the act of union of a cell having male potency with one of female nature, is the process by which living things, whether simple or complex, are created, and vital energy is generated. Ordinarily such a union only occurs between cells belonging to the same species, but it is a matter of common knowledge that within certain limits cross-fertilization, or sexual union of a cell with one of foreign species, is possible even among highly organized animals, and there is reason to believe that it is much more readily possible among animals of a pricitive type. It is important to remember that, where fertilization occurs between animals of different type, *the offspring, or hybrid, always resembles its maternal parent.* Having united with the egg-cell, or female element, the male cell or fertilizing element *entirely disappears*, leaving the egg-cell, for a time, apparently unchanged; in reality, however, a change, far too subtle for analysis, has occurred in the constitution of the cell, which, in view of the result which we know must follow, entitles us to regard it not only as a fertilized cell, but also as a *new individual.* It is interesting to observe that, at the earliest period of its existence, every individual, regardless of its species, consists of a single cell, and that from its outward appearance there is nothing to indicate whether it will continue to exist as a single cell or develop into a highly organized animal; if, however, we know the species to which it belongs, we can predict its final character with the utmost certainty, and conversely, if we know its character, we are able, with an equal degree of certainty, to refer it to the species to which it belongs.

If, then, we believe that the stimulus of fertilization is the primary cause of growth in normal tissue cells, we must, if we are consistent, also believe that the supernormal reproductive activity of cancer cells is due to the same kind of stimulus. In view of the fact, however, that normal growth is regulated in accordance with the requirements of the body as a whole, while cancerous growth is destructive, and independent of control, we cannot believe that normal growth and cancerous growth are due to the *same act of fertilization.* All the normal cells of the body were created together by a single act of fertilization, and each cell or group of cells is a part of a system the plan of which was an inherent quality of the egg-cell from which they were derived; hence their growth is regulated in a systematic manner for the benefit of the body as a whole. If, however, we may suppose that each group of cells, as, for example, those of the skin, liver, lungs, kidneys, etc., was the result of an independent act of fertilization, we cannot imagine that the consequence could be otherwise than a disorderly arrangement of structures growing and functioning regardless of each other and without any intelligible purpose—that is, growing in practically the same manner as cancer grows in reality. A growth such as cancer, which, in the sense of the foregoing, is independent of the controlling mechanism of the body, must therefore arise from an independent act of fertilization, and, having regard to the identity of cancer cells with tissue cells, this implies *fertilization of a tissue cell.*

The foregoing is only a very meagre outline of those considerations which seem to be of the greatest importance in the study of new growths in general and of cancerous new-growth in particular, but if it serves to direct attention to the fundamental principles which govern the phenomena of both normal and abnormal growth, it will suffice for the present purpose. The proof that cancer is due to an independent act of fertilization or to any other cause depends, not on theoretical considerations, but on facts which are open to verification at any time. Since, however, in the minds of many persons there seems to be an exaggerated idea of the importance of those facts which are revealed by experiment, together with a disposition to underestimate the value of any truth which has not been disclosed in a research laboratory, it may not be amiss to point out that, as the history of cancer for the past twenty years abundantly shows, if in some respects experimental research has tended towards our enlightenment, in others it has only served to mislead and confuse. From an unprejudiced viewpoint, it should seem that, regardless of their source, all facts are worthy of attention which really contribute to our understanding of cancerous disease; but this presupposes an ability to interpret them correctly,—which is the whole gist of the matter.

With the methods at our command it is not possible, as in the case of tuberculosis, typhoid fever, malaria, and many other diseases, to isolate or render visible the causative agent of cancer, for the reason that the process of fertilization demands that the male organism or fertilizing agent shall disappear, or cease to exist as a distinct entity. If, then, we believe that all growth, including cancerous growth, is primarily due to an act of fertilization, it is futile to attempt to isolate or demonstrate the fertilizing element concerned in the process, not only because we may be as certain of its existence as though we had actually seen it, but also because, for practical purposes, its isolation or demonstration is a matter of little or no importance providing we are able to control its action. At the present time, therefore, a knowledge of the nature of the causative agent of cancer, of the conditions necessary for its action on the body, and of the means by which it may be controlled, is calculated to serve our purpose much better than information concerning its size, shape, and other physical features.

The cancer problem consists of a large number of minor problems, each of which, though distinct from all the others, is, nevertheless, a part of a consistent whole. The problem of the nature of cancerous growth has already been considered; but, in addition, there are problems relating to the distribution of cancer throughout the world, to its distribution in countries, states, cities, and localities, to its appearance in animals other than human beings, to its prevalence as determined by age, sex, occupation, custom, habit, social position, etc., to the differences in the liability of various organs and parts of the body to its attack, to its relation to other diseases, to its progressive increase, to its prevention, and to many other questions which need not be specified at the present time. Problems such as these have formed the subject of careful study for many years, but with results which, being of a negative kind, can hardly be said to have advanced our knowledge in any definite respect; in proof of which the following sentences from a recent work,* representing the view of a number of eminent authorities, may be cited:

> "All the resources of chemistry, physics, physiology and biology, and the study of immunity reactions have been brought to bear upon the problem, and the work is still being carried on; but as yet, the ultimate cause of cancer is not known. Many important facts, however, have been discovered, and by every fact contributed the growing structure of our knowledge of the disease is built up until, for instance, we now know many things that cancer is *not*, and useless expenditure in investigation along these lines has ceased."

There is reason to think that this unsatisfactory state of things is due, in a large measure, to a failure to fully realize the necessity of submitting our judgment to the guidance of those principles which clearly underlie all phenomena of the order to which cancer belongs, and which appeal to us as being the best suited, not only to direct the course which our investigations must follow in order to be successful, but also to serve as a criterion by which to estimate the value of the conclusions arising therefrom. In a matter of such a vast extent as the cancer problem, and one which affords so many opportunities for deviating from the true course, it is reasonably certain that, without some guilding principle, we can never know whether we are advancing toward the point which we desire to reach or whether, like travellers lost in a forest, we are wandering in a circle, and must continue to do so until our powers are exhausted.

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* "What We Know About Cancer," a handbook for the medical profession, prepared by a committee of the American Society for the Control of Cancer, and published jointly by the American Society for the Control of Cancer and the Council on Health and Public Instruction of the American Medical Association.

Since we cannot regard the cancer problem as being otherwise than consistent throughout, it follows that any theory, hypothesis, or explanation which is true of the cause of the phenomenon of cancerous growth must be true of every manifestation of the disease, regardless of the part of the body affected or of the conditions and circumstances under which it arises. According to our belief, then, that the stimulus of fertilization is the exciting cause of cancer, we may judge of the merits of any solutions of the cancer problem or any part thereof; the test of their value is the degree in which they are consistent with this principle, and also with each other. If the various opinions or hypotheses purporting to explain the causation of cancer which, from time to time, have received more or less attention, are tried by this test, it will be found that all are untenable and that few are deserving of more than a superficial notice; of these the attempt to explain the causation of the disease by the supposed influence of long continued stimulation or "chronic irritation" is worthy of some consideration, partly for the reason that it is regarded with the most favor at the present time, but more especially because it represents a half of the truth.

According to the sense in which the word "irritation" is obviously used in the foregoing expression it can only mean chemical, thermal, mechanical, bacterial, or other forms of physical stimulation, all of which, by reason of the nature of their action upon the tissues of the body, are totally disqualified from taking a leading part in the causation of the phenomenon of cancerous growth, though, as it will appear hereinafter, some form of physical action is always concerned in the creation of the *conditions* under which cancerous phenomena appear. The consequences of physical action—including bacterial action—upon the tissues of the body never tend to be otherwise than destructive in some degree, whereas the nature of cancer is obviously constructive, and inasmuch as it is impossible to reconcile the effects of physical action with the nature of cancer, it is equally impossible to accept the doctrine of "chronic irritation" as being either sound or scientific. It seems doubtful whether this doctrine would ever have been received with any favor were it not that it harmonizes with a number of facts which, in combination, constitute one of the most important features of the cancer problem; thus, for example, it is consistent with—but does not explain—the fact that cancer of the lip or tongue follows tobacco smoking, that cancer of the skin of the hands follows exposure to x-rays, that chimney-sweep's cancer appears in parts of the body which have been irritated by the soot, that cancer of the stomach arises at the site of a pre-existing wound or ulcer, and so forth, through a long series of cases, all of which have one feature in common, namely, the presence of a lesion prior to the appearance of cancer. The fact that cancer develops at the site of a preëxisting lesion is too well established to be successfully disputed, but it does not follow that, because of this, lesions or the irritation resulting therefrom are the *cause* of cancer; for, by the same kind of logic, we might say, with equal reason that because tuberculosis has frequently been observed to develop in a part of the lung which was previously the seat of pneumonia, pneumonia therefore is the cause of tuberculosis. Certain facts, to appear in due course, will enable us to realize the full extent to which the doctrine of "chronic irritation" is fallacious; for the present, it must suffice to state that it is altogether inconsistent with the distribution of cancer throughout the world and in countries, states, cities and localities; with the disproportionate manner in which it attacks various parts and organs as, for example, the stomach, in which it is exeeedingly common, and the lungs in which it is extremely rare; with its relation to civilization, and its rate of increase in this and other civilized countries; with its relation to typhoid fever and other water-borne diseases, and to a large number of other questions equally important in the study of its causation.

The protective surfaces of the body, that is to say, the outermost layer of the skin and the innermost layer of the mucous membranes are composed of cells which, by virtue of the fact that they are dead, cannot respond to the stimulus of fertilization. Their function is to shield the living cells from external influences, which they do very effectually so long as they are intact; but if, as the result of disease or injury, a defect or lesion occurs in any part of their surfaces, the living cells are then exposed to various hurtful influences, and among others to the action of fertilizing agents. A fertilizing agent cannot gain access to the living cells of the tissues through any part of the protective surfaces of the skin and mucous membranes except at the site of a lesion, and it is for this reason, and not because of any form of pathological irritation that, in the vast majority of cases, cancer arises at the site of a pre-existing lesion. A lesion takes no active part in the causation of cancer, but serves merely as a gateway or portal for the admission of fertilizing agents to the living cells of the tissues, nevertheless, it would be a serious mistake to suppose that, because its part is only a passive one, it is of less than first rate importance, because in due time it will be shown that of the few conditions or factors which are really essential in the causation of cancerous disease a lesion is one.

In the great majority of cases the site of a cancer is determined by a lesion, but occasionally it happens—and more especially in wounds due to injury—that, instead of uniting with a tissue-cell in the immediate neighborhood of the lesion, a fertilizing agent may enter the bloodstream or lymph-stream and being carried therein may give rise to a cancer in organs and parts of the body which are never directly exposed to external influences, as, for example, the ductless glands, and the bones and fibrous framework of the limbs and other parts. Also, there is reason to believe that, more particularly in the case of the breast and possibly of other glands, fertilizing agents may travel through the ducts to the cells of the breast substance proper, and so give rise to cancer in the deeper parts of the organ. At first sight, it might seem that such cases are contrary to the rule that a lesion is an essential condition in the causation of cancer, but having regard to the fact that the ducts of the breast and possibly of other glands serve the same purpose as a lesion, namely, to admit fertilizing agents to the living cells of the tissues, we cannot fail to perceive that, though the details of the process are somewhat different, the principles involved are the same. There is, therefore, no inconsistency in such cases, and if we choose to regard them as exceptions to the rule, it must be as "exceptions which prove the rule."

In the light of the foregoing conception of the part played by lesions in the scheme of cancer causation, many things become clear which heretofore were obscure. We can see, for instance, that cancer is not determined by "heredity" or other tendencies inherent to the individual, but that, other things being equal, it prevails among the members of any community in direct proportion to the degree in which they are liable to lesions, and that a similar correspondence may be observed with respect to its incidence upon the organs and parts of the body. Hitherto, it has been taught that, in some unknown manner, cancer was determined by age, habit, custom, occupation and other influences of a similar kind, but having regard to the fact that, by reason of a tendency to degenerate, and a lack of reparative power, the tissues of persons beyond middle age are unable to withstand exposure to injurious influences with the same success as formerly, and tend in consequence to become defective in various ways, and also that certain customs, habits, occupations, etc., are calculated to cause lesions, and that though some of these lesions become cancerous, *a greater number never do so*, it seems to be more in accordance with the facts and with reason to believe that *age, habit, occupation, etc., determine the appearance not of cancer, but of lesions.*

From the foregoing it is evident that fertilizing agents, living tissue-cells, and lesions are essential factors in the problem of cancer, but having regard to the fact that fertilizing agents are derived from certain organisms, namely, protozoa, which exist in water, and that they are conveyed to the body only in water, it is clear that the rôle of water in the causation of cancer is as necessary as fertilizing agents, tissue-cells, or lesions, and that, therefore, water must rank with them as an essential factor in the problem. These four factors are the key to the whole problem of cancer, and no real insight into the mysteries of the subject is possible without their aid. Two of them, namely, fertilizing agents and living tissue-cells, are of theoretical importance only, while the remaining two—lesions and water—are of value, and, in fact, necessary for the solution of all the practical problems of cancer causation and prevention. If, in accordance with what has already been said, we understand the term "lesion" to mean a breach or defect in the protective surfaces of the body exposing living tissue-cells, and the term "water" to denote unsterilized water, that is to say, water containing living organisms and the fertilizing elements thereof, it is obvious that the factors, lesions and water, may be regarded as including the other two factors; or, in other words, lesions and water, for practical purposes, may be considered as representing the action of all the factors. For convenience, the terms "lesions" and "water" will, unless it is specified otherwise, be used in this sense hereinafter.

If we consider that there can be no effect without its cause, and therefore no cancer without a causative or fertilizing agent, we must expect to find that wherever cancer prevails its causative agent is present also. Consequently, it is a matter of considerable significance that cancerous disease is not confined to the human species, but that it attacks all vertebrate animals, including fishes, throughout the world. Since, then, the causative agent of cancer is universally present, and all vertebrates are exposed to it in common, it becomes virtually certain that it must exist in water; otherwise, it would be impossible to explain or even conceive how the disease could appear in fishes. It does not follow from this, however, that water is the only universal medium to which fishes and other vertebrates are exposed in common, but, inasmuch as there is nothing to suggest that other media are concerned in the causation of cancer, it is not necessary to consider them.

With a few unimportant exceptions, protozoal organisms are found in all water-supplies, but their density, or number in a given quantity of water varies in accordance with certain conditions, some of which are favorable, and others unfavorable to their development, but, notwithstanding a suitable temperature and the presence of adequate supplies of food materials, oxygen, and an environment entirely favorable in all other respects, they can never attain their highest development except under two conditions, namely, exposure to sunlight and quiescence. Hence, in waters protected from sunlight, protozoal organisms, if present at all, are found only in small numbers, while in waters exposed to sunlight, their numbers will vary according to the degree of movement to which they are subjected,—stagnation implying maximum numbers; moderate movement, medium numbers; and rapid movement, minimum numbers. We are thus enabled to distinguish three classes of surface water which, according to the numbers of protozoal organisms present therein, are as follows:

1. *Maximum numbers. Stagnant waters exposed to sunlight.* To this class belong the waters of ponds, small or medium-sized lakes, reservoirs, and, in some cases, the still waters along the banks of sluggish rivers.

2. *Medium numbers. Waters in constant and gentle movement and exposed to sunlight.* This includes practically all rivers and streams in low-lying countries, and the waters of great lakes and inland seas, the surface of which is kept in motion by wind-action.

3. *Minimum numbers. Waters in constant and rapid movement and exposed to sunlight.* This comprises all rivers and streams in mountainous regions.

Inasmuch, therefore, as the character of water is determined by the physical features of a district, and since all communities, excepting urban populations, are dependent upon natural sources for their water supplies, it follows that the incidence of those diseases which are due to living organisms in water must correspond, not only with the character of the water, but also with the physical features of the district. As a matter of fact, the association between the physical features of a district, the character of its water-supplies, and the incidence of certain diseases is so close as to constitute a proof of a causative relation between them. If, then, we accept this as being true in the case of some diseases, as, for example, malaria or yellow fever, we cannot reasonably refuse to avail ourselves of the same kind of proof in the case of other diseases having the same relationship to water and the physical characteristics of a district. If, therefore, it can be shown that the distribution of cancer, not only in countries, states, and localities, but also throughout the world corresponds with the development of protozoal organisms in water, that every organ or part of the body is liable to the disease in proportion to the degree in which it is exposed to each class of water, that the disease tends to increase with increased exposure of populations to water drawn from stagnant sources, that occupations, habits, customs, and other circumstances predispose to the disease according to the degree in which they favor the production of lesions and exposure of the same to water, and that a constant relation exists between certain water-borne diseases, more especially typhoid fever, and cancer, we shall then be in a position with respect to cancer very similar to, and certainly not less advantageous than that which we occupied towards malaria and yellow fever before the possibility of their control became an established fact.

*(To be continued.)*

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## SPINAL CURVES IN GROWING CHILDREN.

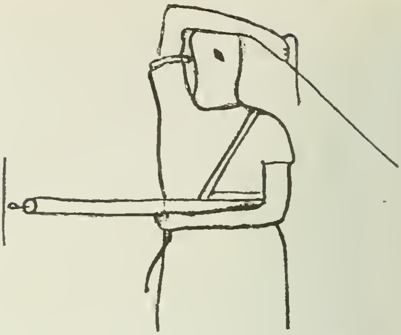
By E. H. Bradford, M.D., Boston.

If a growing girl is brought to a doctor's office for advice as to the treatment of a slightly projecting shoulder or hip, the surgeon will often find it difficult to form a definite opinion as to the probability of benefit to be expected to follow treatment or the danger of increasing deformity if thorough treatment is not followed.

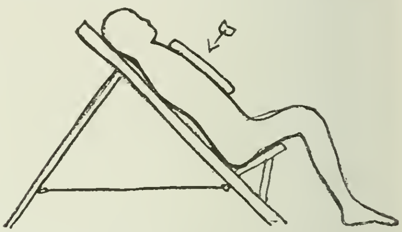
The treatment commonly employed in the severe forms of the deformity is of doubtful advisability in slight cases, while simple postural or gymnastic measures cannot be relied upon to correct twisted bone. To enable the physician to form his opinion more definite information is wanted.

In a growing child with round shoulders, the spine is either stiffened abnormally in some parts of the column, or the flexibility is normal. The same is true in side curves. These differing conditions need different treatment, and if commencing scoliotic rotation is present, more rigorous measures are needed.

The normal flexibility in spinal column in the young varies considerably from that found in adults. This can be seen on examining a number of records of spinal flexibility. These can be made with sufficient accuracy by marking on a plate of transparent glass against which the patient's back rests when the patient is standing straight, and also when leaning to both sides. A skin pencil mark on the spinous processes is seen through the glass when this is marked on the glass, and a record of the side flexibility of the column is made. This method will be found useful in helping to determine commencing stiffening spinal ligaments, localized irregularly shaped cartilage or bone. In recording anterior curves, another method is needed, as the projecting scapular masks the real spinal lines of the patient as seen from the side. A pencil bearing tracer with a curved, upright rod to follow the spine without touching the scapular can be used for a side section of the trunk, unmasked by the projection of the scapula.



Self-correcting Stretching Exercise for Stiffened Curves.



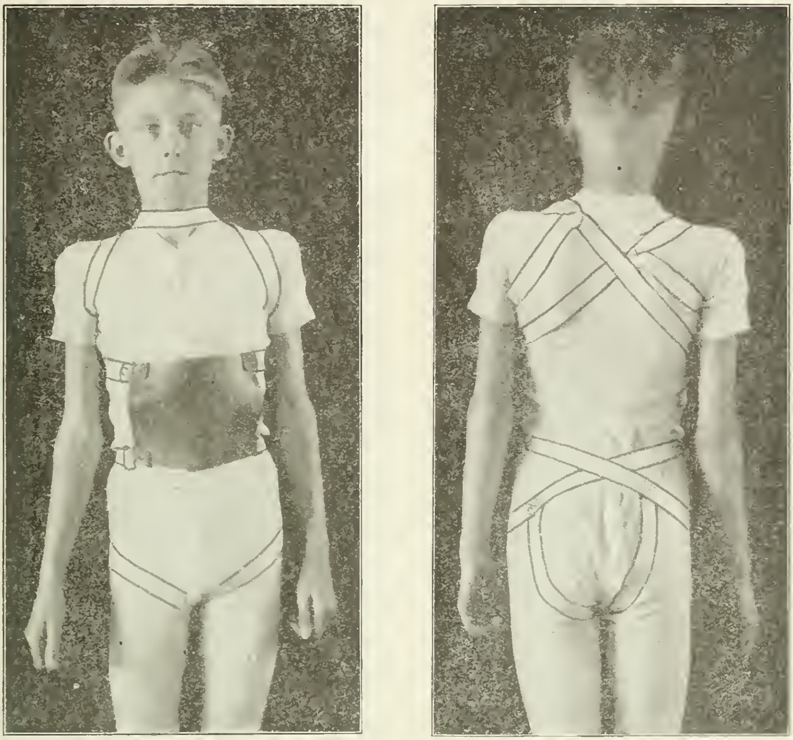
Reclining Board with Front Pressing Board for Twisted Curves.

Having information on these facts, the surgeon is able to determine whether it is necessary to attempt to stretch shortened tissue, or if muscular or postural treatment will be sufficient.

If a spine is flexible in its curves, these will disappear when the patient is recumbent. In an erect position, flexible spines sag under their load if the muscles are weak or easily tired. It is therefore desirable to note the strength of the spinal muscles.

The principles of treatment are that easily tired backs should be properly rested, weak muscles backs should be strengthened, and stiffened parts of the column should be made as flexible as possible.

Anyone familiar with inspection of the school children of our communities is aware of



Round Shoulder Check Rein Straps.

the faulty figures too frequently seen. This is by no means more noticeable among the poor, in fact, it has appeared in some localities, that the richer class is poorer in respect to the vigor of the carriage, even in childhood.

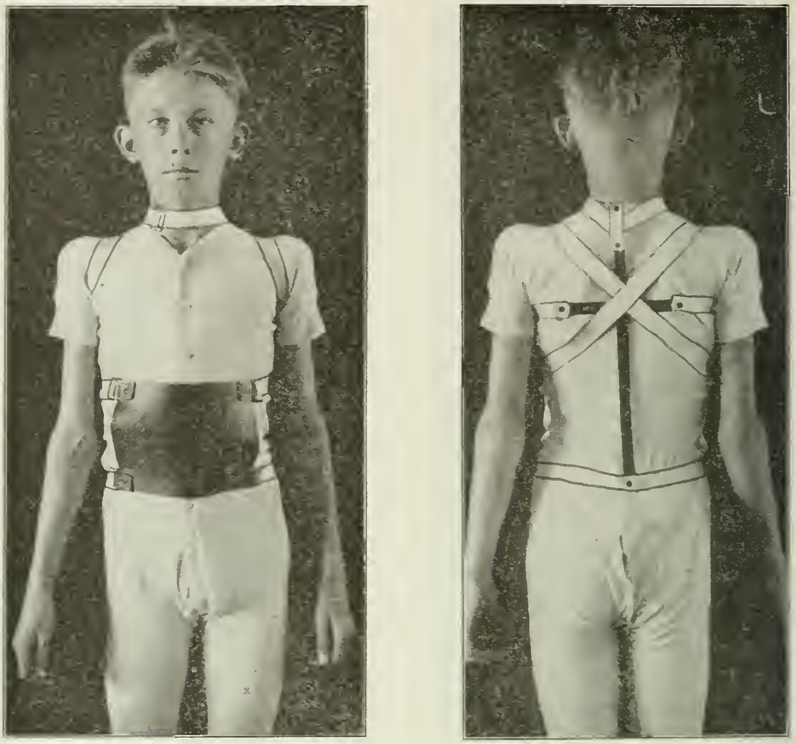
Curved and twisted backs, flat chests, distorted trunks, all are causes of enfeeblement, even if they are not symptoms of disease. A careful study of measures both by prevention and remedy is important.

The amount of medical literature upon this subject published in the last thirty years, shows not only the importance of the subject, but also the needed amount to be learned, and yet the practitioner who is confronted with the simplest form of the problem, namely, the treatment of a child of twelve presenting to a slight degree the deformity of a projecting shoulder or a prominent hip, finds little to guide him in his opinion.

The pen of a Rabelis would be needed to describe the various methods, not only authorized in textbooks, but actually employed formerly in European orthopedic institutes, where the rights of childhood are either less regarded or more urgently claimed.

Few, if any, American physicians would condemn a healthy, growing girl to a year's exile of half bed life and gymnastics, or to six months of a spinal couch in a special institution, or to the wearing for years of clumsy, heavy corsets, merely because the bared back showed to apprehensive parents, an abnormality in contour, with the only promised benefit from such rigorous treatment, that the curvature would be prevented from increasing.

Spinal curvatures, in most instances, are not to be regarded as a definite disease to be treated medically or symptomatically, but as a fault in growth. Treatment is not simply the correction of the curves so much as the guidance of



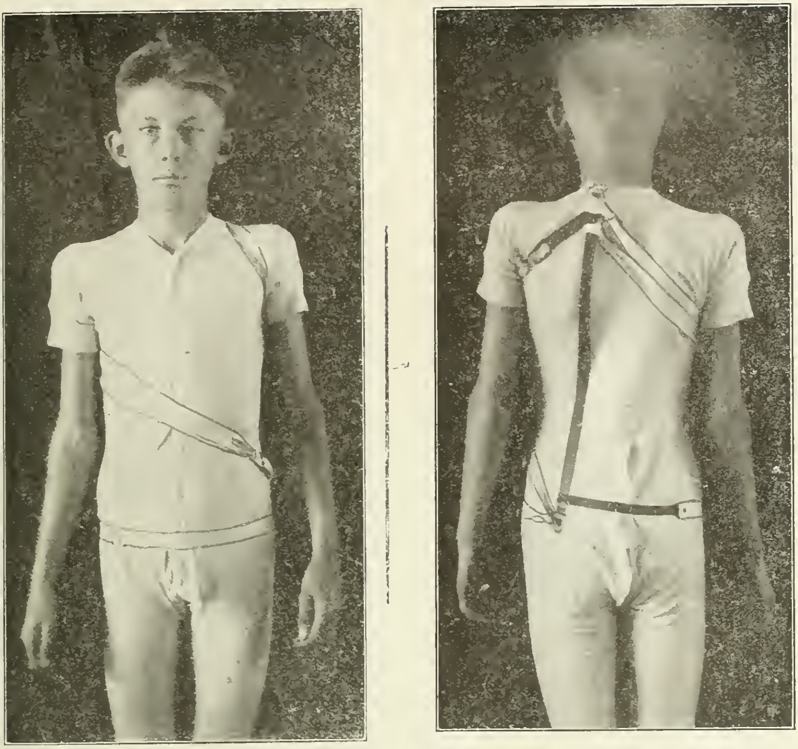
ROUND SHOULDER BRACE.

the growth to a normal standard of carriage or trunk shape.

The chief causes determining spinal curves may be understood without difficulty: The spine of the new-born is flexible, bending in several directions, forwards, backwards, sideways, and capable of twisting on itself to a limited degree. In the upright position, it curves and cannot be held erect until the muscles gain their normal strength. With strengthened muscles, the erect attitude is assumed with a balanced spine with slight normal, forward and backward curves, adequate flexibility and proper rigidity for erect locomotion and adjustment to changes of position. Abnormal curves come if there is muscular weakness, causing undue sagging of the spine, or if curved attitudes are too often or too long assumed by an inadequately resistant spinal column. What these curves will be depends upon the resistance of the column, the extent of the load carried and its direction. Abnormal curves vary according to definite classifiable types, namely forward and backward curves, side curves, single and double curves with twists, curves with stiffening tissues and changes in the shape of the bone structures. (Congenital defects, structural anomalies are infrequent and are not considered here.)

The causes of differing abnormal curves are many and not easily recognized: their action is gradual and may be checked by increased structural resistance of the vertebral bodies. In the progressing cases, the abnormal curves increase until they become more or less fixed with structural changes of ligaments, fascia, muscle, cartilage and bone. The rotation of the vertebrae as the abnormally curved column is subjected to downward pressure beyond its resistance, drags with it the connected ribs and characteristic deformities result.

While in the earlier stages the curves and



Lateral Curvature Brace and Spinal Straps.

twists are more or less correctible, they may become rigid and unyielding with marked structural changes from abnormal strains and pressure. Groupings can be made of importance to the specialist, according to the shape of the curves, namely, single, double, dorsal, lumbar, etc. For the general practitioner, the management of spinal curvature cases, a practical grouping will be of convenience:

1. Habit curves in healthy backs.
2. Weak backs, with weak muscles or back tissues.
3. Twisted backs, with varying resistance to connecting pressure.

The physician will be aided in forming his opinion as to the proper management of cases by informing himself as to the child's rate of growth, ratio of weight to height (compared with normal standards), the child's general condition, habits of activity, and commonly worn clothing. He should bear in mind, that while certain variations in the forward and back curves of the spinal line may fall within the normal limit, marked hollow backs, flattened chests, projecting shoulder blades are not normal, and that a lack of symmetry in the slope of the shoulders, the side lines of the trunk and hip, as seen from behind, is not normal, nor is a difference in the distance of the tips of either scapulae from the spinal line (that is, the line of the spinous processes) normal. The spinal line seen from behind is straight in the erect standing position, and bends equally to either side in side bending.

Habit curves should not occur in healthy children with a normal environment. If observed in children of good physical development, faulty attitudes in sitting, ill-suited chairs commonly used, indolent habits, or constricting clothing, are all to be considered as possible contributing causes. The best treatment for this condition is a daily drill of simple setting-up exercises, with removal of any faulty conditions of seating or clothing, specific directions for active play is essential. There can be no question that the proper seating of children is a difficult problem. The fault lies, not so much with the seating at school, although that is often faulty, but in the home chairs, which are made for adults and do not fit young children, who drop into faulty positions unless their activity keeps them from any habitual position. The fact that the greater part of the waking day in a child's life is spent seated with the back muscles but little exercised, the back partly supported and partly stretched, the child leaning against an ill-fitted chair-back, cannot be ignored. Two to three hours active exercise are, at most, as much as is passed by the average school girl. This suggests that the prevalence of back curves may be due to chairs, and that curvatures of the spine are in part a chair deformity.

In support of this supposition, may be mentioned the apparent fact that primitive and chairless people seem to be more erect in their carriage than chair-using people. If this is the case, the greater domestic use of low stools for growing children would seem advisable.

Whether backs are weak from a lack of bone tissue resistance, or lack of firmness of ligament, or more from a lack of muscle tone, the condition of weak backs in children needs treatment. The condition can be recognized from evidences of more than usual fatigue and by sagging curves of the spinal line. The judicious treatment of the condition is adjustment of hours of active play and enforced rest, with, where possible, special exercises and suitable means of back support in seats used for any length of time in the daily life of the child. In increasing curves of this character, mechanical supports may at times be needed to check spinal sagging.

Where there is a twist as well as a curvature, the condition demands careful treatment, not only for the correction of the curves, but also for the rectification of the rotated ribs. This requires mechanical correction, either by intermittent or constantly applied pressure, and needs specialized treatment.

In treating more resistant curves, care must be taken that the proper treatment is applied definitely to the resistant and not the flexible part of the column. In infantile spines, there are no resistant curves. Side flexibility is found in all directions to a much greater degree than is seen in adolescent or older spines. In adult vertebral columns, there is more bone and less cartilage and consequently less side flexibility without rotation, but in infantile columns pronounced twists occur if the upper part is crowded down, unless the spine is bent strongly backwards. Twisting of the vertebrae follows pressure on the corresponding ribs. Stretching abnormally resisting curves, with shortened tissues, can be effected if correcting pressure or pull is applied directly on the convexity of the curve, with counter pressure above and below the curve.

The problem in correcting resistant curves is a mechanical one and requires some care to secure proper precision. Otherwise, little will be accomplished, or the curves may be increased. Muscular gymnastics alone cannot be adequately corrective in abnormal resistant curves.

In treating curved spines, the surgeon should be able to furnish measures which can be readily applied and can effectively counteract stiffened fascia and ligaments.

In attempting to stretch spinal curves, the load should be removed from the spine. This is done most conveniently to the patient when in the semi-recumbent position, and properly adjusted straps for head and side pull, attached to pulling weights, can be arranged to give correcting pressure for any desired time and to any extent.

A board sloped to any desired angle, furnished with a seat to prevent the patient from sliding down on it, enables a tired back patient to rest and offer a proper position for correctly stretching. If upon the trunk of a patient lying on the reclining board, a short board is placed, and the sides are strapped to the reclining board, any amount of pressure can be made on the twisted and projecting ribs and correction made on the spinal rotation. This intermittent correcting pressure is suitable for slight degrees of twists in young cases, to whom the constant pressure of plaster jackets is inapplicable when the muscle weakening effect of a heavy corset cannot be disregarded. Daily rest of the column can be furnished by the prescribed use of the reclining board.

Elaborate gymnastics and postural movements requiring supervision are not well suited for home treatment which necessarily forms an important feature in the treatment of so chronic an affection as spinal curvature.

Besides the usually prescribed dumb bell and weight-pulling exercises, patients with spinal curves should be directed to carry daily, for a stated time, upon the head, a basket containing specified weight. This gives both poise and strength to the spinal column and is an exercise suited to home direction.

Even after spinal muscles have been strengthened and abnormal stiffness of spinal curves have been made more flexible, the patient often needs to avoid habitual faulty positions. This may be done by conscious efforts on the part of the patient or may require mechanical restraint. Cumbersome, heavy and disfiguring appliances are to be avoided. The appliances are either restraints or are to exert some correcting pressure.

A simple unnoticed check rein can be used to restrain a round-shoulder attitude. Around each shoulder a loop of strong webbing is passed,—crossed in the back and buckled to a square piece of leather or cloth placed on the abdomen pressed in, if the straps are buckled passed around the upper parts of the thighs and also crossed in the back and buckled to the lower corners of the cloth on the abdomen. The shoulder blades can be drawn back and the abdomen pressed in if the straps are buckled tightly. The running forward of the head is checked if a webbing strap is passed in front of the neck and fastened behind to the two shoulder straps.

If a stiffer correction is needed it can be provided in the following way: A light spring steel bar is cut long enough to reach from the neck to the buttock, and to this is fastened a shorter cross-piece at the level of the axillary line; webbing straps are connected with the ends of the steel bars and passed around the shoulders, hips and neck and buckled to the abdominal cloth piece, which secures an erect attitude as long as this brace is worn, which can be done under the clothing.

In side curves, a similar steel spring strip can be used, but the cross-piece should extend on the side of the back only and be attached to a strip of webbing, which, passing around the lower shoulder, is connected to the top of the steel bar. At the lower end of the steel, another steel strip is fastened, extending from the middle of the back to the rim of the ilium. If to these, broad webbing bands are attached and passed around the hip on one side, and the prominent shoulder on the other, and tightened in front, a satisfactory correcting pressure is secured for cases of slight side curves.

If constant correcting pressure is needed, it can be furnished through a bivalve celluloid corset cut out so as to avoid pressing upon the hollows. Such a corset needs careful adjustment, and should be so arranged as to give correcting pressure above the axilla upon the neck. A convenient and lighter appliance can be effectively adjusted by combining the light upright already mentioned, with celluloid half shells.

To estimate precisely the value of different methods of treatment in a slowly changing affection like spinal curvature, cannot be estimated by statistics, as conditions vary greatly in individual cases.

Observations upon the condition of a number of cases, some years after the cessation of a carefully conducted treatment, enables the observer to form conclusions of some value to the serviceableness of different methods. Certain facts and conclusions can be noted from a large number of cases under observation for several years. Cases of flexible curves without structural changes in reasonable good health, with either anterior or side curves, can be expected to be restored to normal contour under proper guidance. This result can also be expected where some abnormal stiffness is present, though some special pains may be required to overcome faulty stiffness. Evidence to support this statement was furnished by a number of cases watched from childhood to adult life. Patients with rotation, projecting shoulders or hips, need thorough measures of improvement is to be expected even in young children. It is not difficult, however, to prevent an increase of curves in healthy adolescents, if the case is carefully observed for a sufficiently long period at suitable intervals.

Healthy girls with marked curves and twists may grow to womanhood and maternity. Low lumbar curves in rapidly growing adolescents need especial care, for the reason that bad lumbar curves in heavy adults are to be prevented, as in after life they cause much inconvenience.

Even in distressing resistant adult curves, as was shown in a few instances, relief from painful symptoms was afforded by persistent correcting pressure and muscular exercises.

In the foregoing statements it is claimed that the surgeon can avail himself of a number of serviceable measures which enable him to meet the surgical indications of a slowly changing distortion, checking its progress and, in some cases, correcting deformity.

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# A STUDY OF LEPROSY IN THE HOLY LAND.

By Izak Alcazár, M.D., Boston.

I came to Palestine in 1918 in the capacity of an eye, ear, nose and throat specialist, to bring relief to the civil population and the refugees. In connection with my clinic and hospital duties, I was assigned the care of a few orphanages, schools and the leprous hospital in Jerusalem. Through my visits as consultant to this institution, I became deeply interested in these unfortunate beings. Their condition was pitiable. They seemed to have enough affliction with their cutaneous malady without the additional misery of trachoma and its numerous complications. It is not the purpose of this paper to describe the ocular complications which I was called upon to treat, but to summarize a few of the observations which I made of this disease in which I have become exceedingly interested during the past three years.

Leprosy is an old disease in Palestine, at least as old as the Bible itself. Egyptian, Greek, Roman and Arabic writers have been consulted. It would take us beyond the scope of this paper were we to make frequent references to the subject matter consulted. These have been purposely omitted in order to make the paper more readable.

Whatever may be the relation between the Scriptural teaching and the physical, or any other branch of natural science, the reader of the Bible cannot fail to be struck with the analogy between theology and medicine which is manifest both in the Old and the New Testaments. This is particularly applicable to the disease under consideration. It is indeed remarkable how little is said of the treatment of leprosy and its prevention, and yet how abundant are the sanitary laws laid down in the most specific and detailed form in the Mosaic sanitary code which may be said to constitute the pivotal principles of modern management of leprous asylums, *viz.*, segregation.

It would take us into the theological discussions were we to discriminate between the different means by which, or purposes for which, leprosy was inflicted in Bible times. It is recorded that in some cases it was inflicted as signs, as in the case of the leprosy of Moses, which was of temporary duration; in others as direct punishment for sin. It were better to leave this matter for the theologian to settle.

In Egypt the priests acted as physicians, and appear to have had assigned to them special duties with regards to certain diseases. For example, some had the diseases of the eye, and some of the ear, others of the skin, etc. That Moses who "was learned in all the wisdom of the Egyptians" (Acts vii, 22), introduced sanitary laws for the guidance of the Israelitish priests to deal with cases of leprosy, needs no argument. There is, however, this difference: The Egyptian priests had their canons of practice laid down in their sacred books which they were bound to obey, and which consisted largely of superstitious and ceremonial observances. The chief priest-physicians, the magi, the wise men and magicians of whom Moses speaks, claimed superhuman power in the control of the disease. It is also deserving of notice that neither in the Levitical laws, nor elsewhere in the Old Testament, is there any mixing up of the cures and curative means with the necromantic or superstitious observances which form so prominent a feature in the medical practice of all other peoples in primitive times. This is particularly clear in the matter of leprosy, "for I am the Lord that healeth thee" (Exodus xv, 26), "who forgiveth all thine iniquities; who healeth all thy diseases" (Psalms ciii, 3), "who bindeth up the breach of his people, and healeth the stroke of their wound" (Isaiah xxx, 26).

## NOMENCLATURE OF THE DISEASE.

Since the application of the term *leprosy* to designate the disease described in Lev. xiii and xiv, the greatest confusion has prevailed in the use of the word, and the utmost difference of opinion as to what it implies. This appears to have arisen mainly from the same Latin word—*lepra*, having been used in at least two different senses. Originally, *lepra* was used to denote simply a disease of the skin and was synonymous with the Greek λέπρα, the radical meaning of which is rough or scaly. There is no evidence in the medical literature that the Greek word quoted above was ever used in the First Century to denote anything else but a husky or a scaly disease (Bible Educator, Vol. iv, p. 76 et seq., 1878). This no doubt was a variety of psoriasis, an ancient and very common cutaneous disease in southern Europe and in the Levant. It was not until the Middle Ages when *elephantiasis Graecrum* became known as true leprosy.

Leper and leprosy are always denoted in the Old Testament by words derived from one root (*tsara*). The word is used alike for the leprosy of Moses (Ex. iv, 8), and of Miriam (Num. xii, 10).

### FEW OF THE COMMON MANIFESTATIONS OF LEPROSY

I regret that I did not have the opportunity to study leprosy microscopically. The leper hospital in Jerusalem had an admirable collection of pathological and bacteriological specimens for study. But the ruthless Turk destroyed everything of scientific value to prevent it from falling into the hands of the invading British Army. My opportunities were confined only to the physical masifestations of the disease *in vivo*.

Leprosy is one of the most formidable and hopeless of all known maladies. The nearest analogy to it is syphilis. Its greatness and gravity must have given rise to the term *elephantiasis*. The character of the disease—the thickened, dense skin which it assumes and diminished sensitiveness to impressions—caused the old authors to compare the skin of a leper with that of an elephant.

The history of onset, as I have been able to elicit it from most of the patients with whom I came in contact in the leprous hospital in Jerusalem, seems to be that only in a few cases the disease supervenes suddenly. The onset is usually ill defined and its progress slow and insidious. The first chief features are numbness of the skin, and the manifestations of punctate spots or blotches, irregular in form, and varying in extent, chiefly upon the forehead and upon the limbs, with a general diffused redness upon the face and neck. Then the skin becomes stained, and in the course of a few months or years assumes a coppery or coffee color. Not infrequently the areas assume a hazy whiteness. The eyebrows, nose and ears are the parts of the face frequently affected. The majority of these patients have trachoma as well. It was on this account that I was called upon to administer relief to these miserable human beings. The involved surfaces are moistened with a greasy exudate which later on become dry and scaly. In the early stages anesthesia exists in all the affected spots. When the injury is very deep, involving branches of nerve trunks, the pain is very severe. Few of these patients have any fingers left. They waste away and fall off, bit by bit, with the slow progress of the disease, leaving only the stumps. The mucous membrane of the mouth shows irregular scars, much like those we note in syphilis, only larger and more numerous. Nodules and tuberosities are also seen as elsewhere upon the skin. It is not at all uncommon to see these patients without an arm or a limb, but they usually die after the loss of the member. Out of the present twenty-six patients in the hospital, one had an arm off, two, a foot; two, with one eye, and three were completely blind. No doubt trachoma had also its blinding effect superimposed by the leprosy. I have found only two with ears involved. Most of them have a husky voice. The septum of the nose succumbs, and by contrast the tip of the nose appears much enlarged. They are subject to dreadful nightmares. They awake very suddenly, crying in shrieks and almost maniacal. Life may be protracted from one to ten years. Those with longevity of life complain of internal burning and neuralgic pains productive of great suffering.

Lepers and leprosy existed in Palestine long before the Christian era. That they were in large numbers one need only peruse the pages of the four Gospels. The Crusades, the Saracens, and modern travelers record the horrifying impressions of these leper beggars whom they encountered by the gates of the city and upon the highways. I saw them in increasingly large numbers during my brief visits in the Holy Land, in 1907 and in 1911. When a tourist meditatingly sauntered through the streets of Jerusalem with visions of the past glorious history of the "Holy City," whether they were secular or religious, he was startled out of his reverie by the sudden apparition of a crowd of beggars, "sans eyes, sans ears, sans hair, sans everything." They held up their handless arms, gurgling through their throats sentences of appeal for pity, as they lay in wait for the few coppers that *must* be thrown at them. If these were not immediately forthcoming they arose and followed the traveler, and almost touched him, till they received alms. Previous to the British occupation of Jerusalem, these crowds of lepers had stationed themselves near the gates of the city, upon cross-roads, and upon the highways, wherever the tourist and the pilgrim was wont to pass on his visits to the sacred spots and shrines. If the traveler failed to give heed to their pleadings for pittance, they threatened to approach closer and even to touch the passenger until they got their objecive—which they invariably did, for no one was desirous of being touched by a howling group of lepers for the sake of saving a few coppers.

During the Turkish régimé these mutilated and disfigured human beings were allowed full freedom anywhere outside the walls of the old city of Jerusalem. For a number of years they had lived in a cave on the slopes of the Mount of Olives, near the village of Siloam. Several hundred of them, thither would herd themselves at night like hunted animals. About an hour before sunset, these groups of lepers who had segregated themselves in the morning to the various points of vantage of attack upon the tourists were now seen wending their way towards the village of Siloam. On their way "home," they would stop near the vegetable and fruit gardens, without the gates, to purchase food with the alms which they had acquired during the day. They could only make their purchases from what was obtainable without the city walls. After the arrival of the various companies they assembled together all their purchases. This was divided among them by their chief. The same was done with the money that was left from the total income of the day. They married among themselves, and all matters of dispute were settled by their chosen chief, whose word was law and final. In short, they were a clan who lived a sort of communal life very much like the gypsies. Thus it has been from time imme-

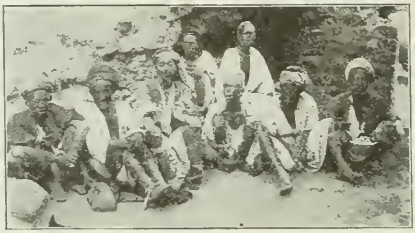

FIG. 1.—A group of Jerusalem lepers seated at the entrance of the cave (their home) situated on the slopes of the Mount of Olives, near the village of Siloam. Elephantiasis is well marked on the patient at the extreme left. Every patient in this group is a Moslem. Only two have survived the ravages of war.

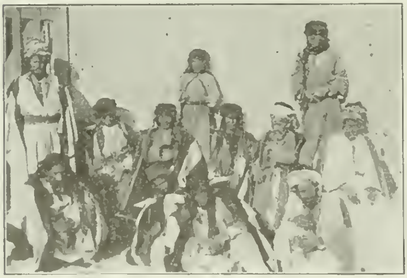

FIG. 2.—Surviving lepers in Palestine. Two of these miserable beings have lost a limb as a result of panophthalmitis. The author enucleated the right eye of the patient in 1919. He is second at the left of the first row.

FIG. 3.—The German Leper Hospital situated at the outskirts of the city of Jerusalem. (See text.)

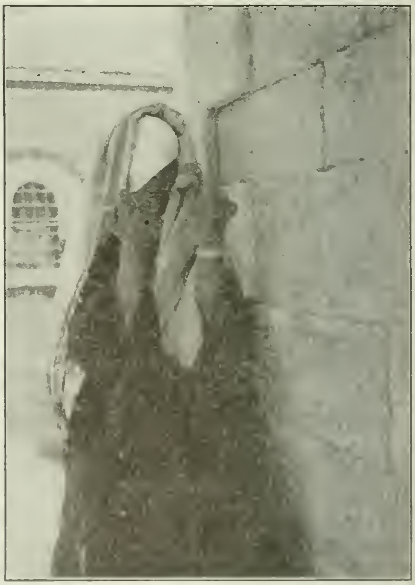

FIG. 4.—This leprous woman came to my clinic at Jaffa, Palestine, in August, 1920. She had lost her left eye many years ago. The right eye showed ulcerative keratitis, panus, entropion and trichiasis. Much was done for this desperate case. Her appreciation of the kindness shown her will remain with me as one of the greatest rewards of my labors among the victims of this dreadful affliction.

morial, and would have continued so but for the brighter dawn of day since the British occupation of the Holy Land. Fortunately for the world at large, and no less for the poor sufferers themselves, many of them have been carried away, what from hunger and what from intercurrent diseases and starvation, during the four years of war in Palestine.

Human sympathy has always gone out towards the victims of this incurable disease. Agencies have now and then been ready to extend help and relief, some from purely philanthropic motives, others actuated also by religious principles. This noble example is common knowledge to missionary agencies in various parts of the world, for no other disease centers more the attention of Old and New Testament readers than leprosy. The Roman Catholic Church leads in this benevolent labor of sacrifice throughout its church history. The memoirs of the early Fathers contain lengthy passages of the labors of priests among the lepers. In one account, the picture is so touching that it records the impossibility of administering the Holy Sacrament because the disease had extended so deeply that the patient could not swallow the Rite, ("Maniplus Curatorum," Bremen, 1577).

These lepers are very superstitious, and have great faith in necromancy and witchcraft. They prefer the employment of such means rather than to resort to modern methods of alleviating their sufferings. They have great faith in the cure of waters from fountains of certain localities in Palestine, or in drinking the blood of dogs mixed with dejecta of infants under two years of age, but none of the patients I interviewed who had tried the remedy could quote an instance which, in their experience or that of their contemporaries, had proved efficacious, but they continued the practice on the strength of tradition.

In the year 1865, the Leper Hospital in Jerusalem was founded by Frau Baronien von Kreffenbrink Ascheraden aus Pommern. The institution had a capacity of sixty beds, and was supported by funds raised in Germany, England, and to some extent in the United States. It was put in charge of the Moravian Brethren. During the war it continued its benevolent work through assistance from England and America. It has today twenty-seven patients. The asylum was founded for the purpose of treating the lepers of Palestine and inducing them to enter the hospital as inmates, hoping in time thus to separate them from their families with an aim to diminishing the spread of the disease. This purpose was met with many difficulties, for married persons would not submit to segregation; only those so miserably helpless yielded to this wise provision.

I have been unable to ascertain from old residents of Palestine, or from the surviving records of the hospital, if there were any Jews among the afflicted. Practically all of them are Moslem peasants. That there were many lepers among the Jews in Old and New Testament times, one only needs to read Leviticus and the Gospels for conviction. Josephus and the Talmud state that "they were excluded from the Temple and the Synagogue." They had, however, separate seats assigned to them, and were required to enter first and leave last, but they were only those whom the priests considered of the "clean type," that is to say, those who had the disease in its earliest manifestation.

Whatever view may be taken of this dreadfully disfiguring disease, two things are certain: first, that they are subjects of unspeakable suffering and misery; and second, that the only hope presented to Palestinians for preventing its spread and exterminating the evil is by segregation, resulting in great benefit to the lepers themselves and to the community in which they live.

Palestine has entered upon a new era. The British rulers of the land are now seeing to it that this ancient and repulsive disease is entirely exterminated from Palestine, and that as Israel is now promised a return to its ancient home land, may they, as well as the pilgrims of other religious sects find leprosy conspicuous by its absence, and thus make Palestine a Holy Land indeed to Jew and Gentile alike.

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# LYMPHATIC DRAINAGE OF ASCITIC ABDOMEN THROUGH PARAFFINED VEINS.

By Richard J. Behan, M.D., F.A.C.S., Pittsburgh, Pa.
*Surgeon to St. Jospeh's Hospital.*

Ascites may be due to several factors. The most important of which is cirrhosis of the liver. Of this there are two types, biliary and the portal. The biliary cirrhosis is benefited in many cases by producing drainage of the bile duct. It does not, as a rule, cause as much ascites as does the other form, due to portal obstruction.

With the portal-obstruction ascites, jaundice is absent. There have been various operative means of correcting this ascitic condition. The operations devised being: first, the development of an anastomosis, between vessels on the surface of the liver or the spleen, with vessels on the under surface on the diaphragm, or of the abdominal wall; second, the development of an anastomosis, between the omentum and the abdominal wall; third, direct drainage of the ascitic fluid through a tunnel, through the abdominal muscles into the substaneous tissue spaces of the abdominal wall; fourth, direct drainage of the portal vein into the inferior vena cava or of the ascitic fluid through the implanted upper segment of the internal saphenous vein into the circulatory (veinous) system; sixth, lymphatic drainage through the method of Handley, by which ligatures are passed out from the abdominal cavity and inserted in various directions in the substaneous tissues.

All of the above methods are successful in a proportion of the cases. The first method, that is, the one in which the peritoneum is attached to the anterior abdominal wall, or else is embedded underneath the peritoneum is successful in about 37% of the cases. This is a fair recovery, when we remember that ascites is frequently the last and most fatal complication in cirrhosis of the liver.

In regard to the sixth method, that is, the method of lymphatic drainage, I have undertaken, in two cases, a modification of this method, and while the time has not been long enough to prove its absolute effectiveness, I have considered it wise, nevertheless, to report it at this time, with the hope that others may be induced to try it.

In the two cases in which modified lymphatic drainage was used, it proved successful, both in reducing the quantity of abdominal fluid and in preventing its recurrence. The first patient was a Mrs. E., who entered St. Joseph's Hospital, Pittsburgh, Pa., on August 14, 1919.

The chief complaint of the patient was swelling of the abdomen and feet. She had severe pain over the entire abdomen. The present illness began in May of 1919, when she noticed that the feet were swollen. This swelling gradually increased until the abdomen was involved. She started to vomit in August.

The condition has been increasing in severity, until at the time of the examination at her entrance to the hospital on August 14, the patient was found to be very short of breath, able hardly to speak and extremely weak. The examination by Dr. R. J. Behan showed the following: a patient of 41 years of age, weight 134 pounds. In January of 1919, she weighed 154 pounds. The skin is moist, the lips are chapped. The breath is very foul. The eyes are negative. The mouth is negative. The neck is negative. Thyroid is not enlarged, small glands are palpable on the left side in the supraclavicular region. The chest shows dullness on the left side at the seventh rib in the mammary line, and the fifth rib in the mammary line on the right side. On percussion on the right side in the axillary region, there is dullness; and distant breath sounds are heard. The vocal fremitus is also reduced. On aspirating, fluid is found. The heart is O. K. The abdomen is very much distended, smooth and glossy, and shows many lines and albicantes. It is slightly tender to pressure. There is dullness on either flank. The liver extends below the costal margin. It is five fingers in breadth. It extends from the seventh rib in the mammary line. Dullness in the flank changes on change of position of the patient, becoming less marked when the patient lies on the opposite side to the side percussed. There is slight dulness towards the pubes, more marked on the left side. The stomach is about two fingers below the umbilicus. The inguinal glands are large, both sides. There is no tenderness in the lumbar region on either side. The line of dulness, when the patient is reclining is about two inches above the level of the anterior superior spine. The umbilicus bulges. The patient lies with the limbs drawn up. Tenderness is present over the gall-bladder. The abdominal wall is edematous and the edema is more marked on the right side. Vaginal examination is negative. The extremities are edematous. Both feet are swollen. Edema is present in the fingers.

The diagnosis at the time was that the abdominal cavity was distended by an inflammatory peritoneal fluid. The same condition was thought to be present in the chest, especially so as the patient had a slight fever and a rapid pulse. On August 16, the chest was aspirated. A bloody fluid, which quickly coagulated was obtained. A needle was introduced in several directions and came into contact with the diaphragm at the time of aspiration. A considerable quantity of reddish fluid was removed. The report of the fluid from the laboratory was that it was a transudate. There was no growth on culture.

Operation on August 18, 1919, under local anesthesia. An oblique incision, about 1½ inches above Poupart's ligament was made, down to the peritoneum, which appeared as a bluish membrane. As soon as a slit was made in the peritoneum, a reddish fluid began to pour out. This was removed with great care. Four thousand cubic centimeters of this fluid was drained away. Four strands of twisted cat-gut were inserted into the peritoneal cavity. The other end of this catgut drainage was introduced beneath the subcutaneous tissues. The incision was closed, then sutured by two lines of sutures. The skin was closed with silk worm gut. The sutures were placed close together. After the operation the abdomen was soft. All the fluid, however, was not drained out of the peritoneal cavity. It was also noticed the next day after operation, that there was marked swelling in the tissues where the drainage took place. The patient could breathe better.

On September 18, 1919, the patient's appearance was much improved, no shortness of breath, no flushing. The chest showed dulness on the left side, beginning at the third rib and extending downward. There was also tenderness present. Distant breath sounds are present on listening in this area. Dulness is present in the axillary line on the left side, but on the right there is no dulness present, when the patient lies flat in bed. The abdomen is still slightly distended. The scar of the incision is also distended. The abdomen adjacent to the scar is also distended. The veins of the abdomen are distended more on the left than on the right side.

Fluid evidently is still present, but is localized more to the left abdomen than to the right. The patient showed marked improvement, since entrance to the hospital. Not a great amount of urine is passed. The feet are not swollen.

After the patient left the hospital, she did very well for several months, until the drainage from the abdomen was obstructed. She said that she caught a cold and then the abdomen began to increase in size. This continued until the reentrance of the patient to the hospital. When the patient entered the hospital, February 10, 1920, the abdomen measured forty-four inches at the umbilicus.

Because of the evident failure of our operation, it was now determined to do a further drainage operation. A section of the internal saphaneous (about 12 inches) was removed (2-20-20). This was immediately threaded into a glass rod of suitable size and sent to the laboratory, where it went through the stages of preparation, which pathological specimens are subjected to in order that they may be sectioned. It was imbedded in paraffin. During this time the patient was kept in bed. The amount of fluid in the peritoneal cavity gradually increased and finally it was necessary to do a paracentesis. When the veins were embedded in paraffin, the patient was prepared for operation.

On April 9, 1920, under nitrous oxide-oxygen anesthesia, an incision (Israel) was made over the kidney area on the left, the same as for a nephropexy. The fatty capsule of the kidney was pushed backward and an opening was made into the peritoneal cavity below the level of the lower pole of the left kidney. The paraffined vein was now placed in boiling water and again thoroughly sterilized. While it was still hot, the glass rod was removed. This left a rigid tube composed of a vein permeated with paraffin. Three sections were now made and the ends of each cut transversely, so that two flaps were made at the end of each section. The sections were three to six inches long. One section was then inserted into the upper portion of the peritoneal incision and the edges flapped back and sutured to the peritoneum, so that the end of the tube led directly into the peritoneal cavity. The other end of the vein was then inserted into the fatty perirenal tissue near to the lower pole of the kidney, care being taken not to actually attach it to the fascia, which was intimately connected with the kidney itself. The second tube was then fastened in the peritoneal cavity, the same as the first. It was then pushed down between the peritoneum and the fascia covering the pelvis. It was inserted in the loose tissue, towards the external iliac artery, over the pelvic brim. Several small nicks were made in it so that fluid could leak through. The same had been done with the other tube.

One extremity of the third tube was inserted into the peritoneal cavity and the other end was carried through the abdominal muscles and then through the subcutaneous fascia, almost to

Poupart's ligament. Before the incision was closed, it was noticed that all the tubes were patulous, so that fluid was being discharged from all three into the tissues.

The tissues were now approximated with catgut and the skin with silkworm gut. The peritoneum was also approximated, so that herniation could not take place. This patient did remarkably well after this operation. There was considerable swelling in the left lumbar region for some weeks. There also developed a marked vulvar oedema and oedema of the left leg also became very marked. This oedema of the leg persisted for a long time and at the present writing, March 3, 1921, is still present to a slight degree.

At the time of operation a large quantity of fluid was removed from the abdomen, but no attempt was made to remove all of the fluid. After operation, the abdomen was forty-four inches in circumference at the umbilicus. This circumference gradually decreased, until two weeks after operation it was forty-two, then in one month it was reduced to forty inches, then in another month to thirty-six inches and on November 5, 1920, is was thirty-four inches. On March 3, 1921, the measurement was thirty-one inches.

The patient at the present time feels absolutely comfortable. She has no difficulty in breathing. She is gaining in weight. The present weight is 157 pounds. She can do her daily work, which is housework, and she feels perfectly comfortable.

The second case was that of a Mrs. B. This patient suffered from a similar condition, as the former, that is, from a hydroperitoneum, the result of a hypertrophic cirrhosis of the liver. She was put through a preliminary operation in order to obtain the internal saphenous vein, and the vein was inserted according to the technic devised for Mrs. E.

The patient showed remarkable improvement, also after operation the area over the site (kidney region of lymphatic drainage being swollen and distended and the abdomen gradually becoming less distended. However, after the abdomen had decreased ten inches in circumference, the patient had an apoplectic attack and died very suddenly. Nevertheless, she had shown a remarkable improvement, and had begun to feel fairly comfortable and was very happy.

At present, instead of using the patient's own veins, we save varicose veins removed at operation. These are threaded over a glass rod and are hardened and paraffined the same as is done in preparing pathological specimens for sectioning.

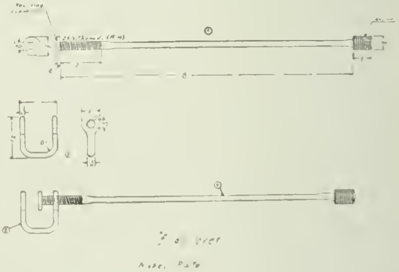
I realize that possibly the time is too brief in which to judge results of the case of Mrs. E. and since, I have had only two cases, one still alive and the other dead from a non-related condition, I have not had sufficient experience to determine the exact benefits of this method of procedure. I have published the technic with the hope that some operator with greater clinical opportunities may more definitely determine the value of this method.

## New Instrument.

### A NEW TONSIL HAEMOSTAT.

By Frederick J. McVey, M.D., Boston.

Since the period of enucleation of tonsils was introduced, we have been alarmed more over operative and post-operative hemorrhages. You probably all are familiar with the different kinds of haemostats, Ex. the ones with the horse-chestnut-like attachments, where one end was placed in the sinus tonsillaris, and the other end outside on the neck of the tonsil; then there is the haemostat with the tonsil-like ends which are on a spring and they fit into the tonsillar fossae; then there is the tonsil clamp which has a long handle like a pair of scissors and brings the two pillars together. My instrument is shaped like a small vice, one part goes behind the posterior pillar, and the other in front of the anterior pillar. There is a long handle attachment, and by turning the handle, the two pillars are brought together. This in-



strument can be used for producing pressure, whether the sinus tonsillaris is filled with gauze or cotton, or nothing. It may also be used for approximating the pillars when sewing is necessary. It also may be used where bleeding is from one pillar by covering the ends with gauze or cotton which has been medicated, and causing the instrument to close. This instrument can be used on both sides of the throat.

* * *

## The Massachusetts Medical Society.

### NOTES FROM DISTRICT SOCIETIES.

The Annual Meeting of the Bristol South District Medical Society was held in Remington Hall, corner North Main and Pine streets, Fall River, on Thursday, May 5, at 5 p.m. The State Department of Public Health presented films illustrating "The Modern Treatment of Syphilis and Gonorrhoea." The officers elected for the coming year are: President, A. I. Connell; Vice-President, H. C. Allen; Secretary-Treasurer, A. J. Abbe; Councillors: A. W. Buck, E. F. Cody (nom.), A. B. Cushman, W. A. Dolan, R. W. Jackson (alt.), A. H. Mandell, J. C. Pothier; Commissioner on Trials, D. P. O'Brien; Censors: W. A. Dolan, R. W. French, C. J. Leary, S. V. Merritt, I. N. Tilden. Dinner. At the same place, at 3.45 p.m., the Censors met the candidates, F. H. Jordan, J. S. C. Fielden, Jr., S. Morein, E. E. Hussey, H. P. Sawyer, G. H. Kershaw, J. N. Risley, S. H. Remick.

The May Meeting of the Springfield Academy of Medicine was held at 137½ State street, at 8.30 p.m., Tuesday, May 10, 1921. Dr. W. Wayne Babcock of Philadelphia, read the paper of the evening entitled, "Morbidity in Abdominal Surgery."

The Annual Meeting of the Worcester District Medical Society was held at the Tatnuck Country Club, Wednesday, May 11, 1921. Dr. George E. Emery gave the oration on "Some Problems in Tuberculosis." The following officers were elected: President, Dr. James J. Goodwin, Clinton; Vice-President, Dr. George E. Emery, Worcester; Treasurer, Dr. George O. Ward, Worcester; Secretary, Dr. A. Wilson Atwood, Worcester; Orator, Dr. A. W. Marsh, Worcester. Committee on Funds: Dr. Homer Gage, Worcester; Dr. David Harrower, Worcester; Dr. Ray W. Greene, Worcester. Censors: Dr. F. H. Washburn, Holden, Supervisor; Dr. C. A. Sparrow, Worcester; Dr. Leslie R. Bragg, Webster; Dr. Edward H. MacKay, Clinton; Dr. Edward H. Trowbridge, Worcester; Librarian, Dr. A. C. Getchell, Worcester; Nominating Committee: Dr. Gordon Berry, Chairman; Dr. Elisha Lewis, Princeton; Dr. F. L. Magune, Worcester; Dr. Timothy Foley, Worcester; Dr. Frederick W. Guild, Grafton. Councillors: Dr. F. H. Baker, Worcester; Dr. W. P. Bowers, Clinton; Dr. William J. Delahanty, Worcester; Dr. George E. Emery, Worcester; Dr. Michael F. Fallon, Worcester; Dr. Homer Gage, Worcester; Dr. James J. Goodwin, Clinton; Dr. Ray W. Greene, Worcester; Dr. David Harrower, Worcester; Dr. E. L. Hunt, Worcester; Dr. Albert G. Hurd, Millbury; Dr. W. L. Johnson, Uxbridge; Dr. George F. O'Day, Worcester; Dr. Charles B. Stevens, Worcester; Dr. George O. Ward, Worcester; Dr. F. H. Washburn, Holden; Dr. S. B. Woodward, Worcester. Councillor on Nominations: Dr. David Harrower, Worcester; Dr. George O. Ward, Worcester, Alternate.

Taunton.—At a meeting of the Trustees of the Morton Hospital, May 4, 1921, Dr. Joseph L. Murphy was appointed to the Staff.

The babies' clinic of the Woman's Club plans to enlarge its activities during the summer, and will deal with all cases applying for treatment. Under Dr. Arthur R. Crandell, with the assistance of other physicians, the work has grown and has become of great value to the welfare of the city.

A son was born to Dr. Andrew J. and Mrs. McGraw on May 4, 1921.

* * *

Massachusetts General Hospital.—A staff clinical meeting was held in the lower out-patient amphitheatre, Monday, May 9, 1921, at 8 p.m.

Program: "Interpretation of the Pyelogram," E. G. Crabtree, M.D.; "Report of Dermatological Cases Treated with X-ray," C. Guy Lane, M.D.; "Preliminary Report of Findings in 2000 Gastrointestinal Examinations," A. S. Merrill, M.D.; "Observations on the Results of Treatment of the Breast with X-ray," K. F. Kesmodel, M.D.

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## THE CHIROPRACTIC CAMPAIGN.

For several years one of the later cults under the title, chiropractic, has been knocking at the doors of this Commonwealth for leave to enter. This system is largely the product of the Palmer School. One of the exponents, J. Shelby Riley, formerly an osteopathic practitioner, came to Massachusetts a few years ago, opened a chiropractic college, taught the distinctive spinal manipulations, and practised among the people. He attempted to confer degrees without first having obtained authority to perform this function. He was prosecuted, convicted, and was obliged to leave the state. It is reported that he is now in Washington, D. C. Other chiropractors were prosecuted and convicted, and were obliged to suspend operations. A few registered physicians claim to be applying this treatment.

The next move was indirect, patterned after military maneuvers, and took the form of a flank attack. Vermont and Connecticut were invaded and capitulated, granting registration to chiropractors, and last winter, both New Hampshire and Rhode Island were attacked. New Hampshire was conquered, but Rhode Island was able to check the progress of the invader. She stands now, according to the testimony of some leading men, in the shadow of the impending renewal of hostilities.

The New Hampshire law defines chiropractic . . . to be the "science of adjusting the course of disease by realigning by hand the twenty-four movable vertebrae of the spinal column or misalignments of the sacro-iliac articulation, releasing pressure on nerves radiating from the spine to all parts of the body and allowing the nerves to carry their full quota of health current (nerve energy) from the brain to all parts of the body."

Three men, one of whom shall be a physician, constitute a board of chiropractic examiners for the purpose of licensing applicants.

The educational requirements are: graduation from a chiropractic school or college which teaches a three-year resident course of six months—each year. Chiropractors may, under the law, adjust by hand any articulations of the spinal column, but shall not administer drugs included in materia medica, or practise major or minor surgery, obstetrics, or any branch of medicine or osteopathy. Under this law, the members of this cult can sign death certificates and treat communicable diseases.

The New Hampshire campaign was engineered by the Palmer School, under the guidance of an eminent lawyer. This school is reported to have an income of three quarters of a million of dollars per year, and is carrying on a propaganda according to well known advertising principles. A part of this course of instruction covers the scheme to "sell chiropractic" to the people.

The campaign in New Hampshire was organized months before the legislative session. Before the passage of this law, New Hampshire juries acquitted chiropractors, and the Collector of Internal Revenue is reported to have said that three chiropractors made returns of larger incomes than any physician in the State.

The method of attack consisted in the presentation of "cured" cases. The hearings were staged in the largest available hall. Cured cases of peptic ulcers, blindness, pneumonia and epilepsy were exhibited, and the audience was impressed favorably, although eminent physicians exposed the illogical claims. All but sixteen of the four hundred and thirty members of the legislature voted in favor of the bill.

The explanation of this stampede seems to be the conviction in the minds of the laity that physicians do not attempt to relieve some of the ills which chiropractors promise to cure.

A recent editorial in the JOURNAL called attention to the advisability of organization in dealing with legislative problems. There will be added to the activities of the Medical Freedom League this organized movement to break down the legal requirements relating to the practice of medicine. Chiropractors may contend that since they do not employ medicines or perform operations, they are not practising medicine. They have practised medicine and, if licensed, will not only use the "chiropractic thrust," but will diagnose and advise. The danger to the people lies in the chiropractic belief that this theory is applicable to the treatment of practically all diseases, and its exponents will temporize with cancer and tuberculosis, just as any poorly equipped practitioner has done in the past.

There are three explanations for the endorsement of the claims of any well advertised cult:

First, the people are impressed with positive claims that any given treatment is effective when supported by lay testimony. This response of the laity kept the patent medicine business on a prosperous basis.

Second, the indisposition of many practitioners to give sympathetic attention to discomforts which are quite definite in the minds of sufferers.

Third, the reluctance of medical men to investigate the application of a treatment and the claims made of favorable results which seem to be unscientific and untrue.

If there is to be any attempt to teach the people the facts, there must be early organization, and plans adopted.

Any effort by physicians should not be inspired by a selfish motive, such as fear of loss of income, rather because of the general purpose of medical practice to promote health and prevent disease or disability. Competent men should be induced to study the claims and practice of the cult, and if there can be found any benefit resulting from the treatment, the principles should be taught to students, and the benefits and limitations clearly defined so that the people may be convinced that the profession is composed of men with open minds. If, on the other hand, there is found to be no physical benefit resulting, other than that derived from massage intelligently applied, disseminate that information, so that the law makers cannot say that they have been left to flounder through uncharted paths.

If the profession is unwilling to meet this movement in an aggressive, scientific and public spirited way, there is only one probable result. If we sit with folded hands, or as pacifists, we must not later deplore a situation to which neglect may have contributed some support. Massachusetts has stood for one standard for all practitioners of medicine, and that standard is based on knowledge of the fundamental sciences upon which the structure of scientific medicine has been built.

## POST-GRADUATE COURSE FOR NEGROES

THE FIRST POST-GRADUATE COURSE in Medicine and Surgery for Negroes in the South came to a close at the John A. Andrew Memorial Hospital, Tuskegee Institute, Alabama, at 12 o'clock M., Saturday, April 30, 1921.

The month of April has been a very eventful one for the Tuskegee Institute. Among the occasions, have been the tenth annual clinic, the meetings of the John A. Andrew Clinical Society and the Alabama State Medical Association, and the launching of the Post-Graduate Course in medicine and surgery at the John A. Andrew Memorial Hospital. These events have brought together one of the most notable assemblages of physicians, both white and colored, that have occurred. The meeting has developed that there are white physicians who are willing and anxious to help improve the standing and professional ability of the colored doctors. Many of the best physicians of the South, as well as many northern cities, have given lectures, demonstrations, and operations in an effort to teach the colored men the latest and best methods in treating diseases. The course lasted four weeks.

It was largely through the influence of Dr. L. W. Johnston of Tuskegee, Alabama, President of the Medical Association of the State of Alabama, that we were able to have so many men of such high standing to give this instruction. Among those from a distance were Dr. E. H. Carey, Dean of the Medical Department of Bailer University, Dallas, Texas; Dr. Frank R. Ober, Harvard Medical College, Boston Massachusetts; Dr. J. Whitridge Williams, Dean and Chief Obstetrician of the Johns Hopkins Hospital, Baltimore, Md.; Dr. James S. Stone of the Children's Hospital, Harvard Medical College, Boston, Massachusetts; Dr. Frederick R. Green, General Secretary, Council on Health and Public Instruction of the American Medical Association, Chicago, Illinois; Dr. M. L. Goodkind of the University of Illinois, Chicago, Illinois; Dr. H. A. Royster, Surgeon-in-Chief of the St. Agnes Hospital, Raleigh, N. C.; Dr. John E. Cannaday, President of the Charleston Hospital, Charleston, West Virginia, and Dr. Fred H. Clark, Secretary of the Medical Association of the Southwest, Oklahoma City, Oklahoma.

We believe that this coming together of the white and colored physicians in the launching of this post-graduate course means that a distinctly new epoch is established in negro medical education.

Principal Robert R. Moton and the Director of the hospital clinic and post-graduate course take this opportunity to extend their sincerest thanks and gratitude to all those who have responded so generously to the call which made it possible to bring about these most satisfactory results.

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## THE A. M. A. CONVENTION

The profession will be especially interested in the invitation of the Association of Military Surgeons extended to those who were not in service. Meetings of this Association have been of great interest.

Dr. F. B. Lund, Chairman, requests that the profession of Boston, and particularly of New England, should register on Monday, June 6, 1921, as far as possible, as this will greatly facilitate the work of the Committee of Arrangements.

The Alumni Association of the Jefferson Medical College of Philadelphia will hold a reunion for Jefferson graduates and their friends during the Convention. Dr. Wallace P. MacCallum of 214 Huntington avenue, is acting secretary for the Association.

All members of the Phi Alpha Sigma Medical Fraternity are requested to register at the table assigned to the Fraternity, so that a "get together" meeting can be held. Dr. E. J. G. Beardsley, Secretary, will be at the Hotel Brewster during the Convention.

All members of Base Hospital 89 are cordially invited to register in the Base Hospital Alumni book and be prepared to attend mess at the call of the Secretary, Dr. Walter S. Lucas, who will be at the Hotel Brewster.

The American Orthopedic Association will hold its scientific sessions in John Ware Hall, Boston Medical Library, on June 2, 3 and 4, and a clinical day at the Harvard Medical School, Building B, in combination with the Orthopedic Section of the American Medical Association, on June 6. Sir Robert Jones of England, Professor Vittoria Putti of Italy, and Dr. Jacques Calvé of France, will be guests of the Association.

There will be a reunion of all medical officers who have served at Base Hospital, Camp Devens, in the Students' Room, Building A, Harvard Medical School, on Wednesday evening, June 8, at 7 p.m. Refreshments will be served.

The twenty-ninth annual meeting of the Association of Military Surgeons of the United States will take place June 2-4 in Boston, Mass., with headquarters at the Copley-Plaza Hotel, and the meetings in the Swiss Room there. A cordial invitation is extended to members of the medical profession, irrespective of whether they are members of the Association or not, to attend the meeting, and as the date immediately precedes that of the Convention of the American Medical Association, it gives an opportunity to be present at both during one trip.

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## MEDICAL NOTES.

The Segregation of Lepers in Louisiana, by the United States Public Health Service, has inspired Frederick L. Hoffman, 3rd vice-president and statistician of the Prudential Insurance Company of America, to write a letter of protest. The objections outlined are as follows: The appropriation of $250,000 is inadequate; the site selected is not suitable, because the more proper location would be on an island, and this contention was supported by the late Dr. Isadore Dyer; the area is too restricted and must be added to with expensive arrangements of fencing and other protective devices, including larger numbers of guards than would be required on an island; insufficient publicity, with a political taint; questions as to the legality of transfer of these unfortunates; and the ill advised publicity given to the leprosy situation. So far as Massachusetts is concerned, it is quite impossible for the average person to estimate the relative value of these contentions, but this plan has the approval of the State Department of Public Health, and confidence in the ability of the officials directly in contact with this problem leads to the expectation that the experiment has merit.

W. B. Saunders Company, publishers, who are regular advertisers in the Journal, have shown considerable interest in their employees by arranging almost luxurious rest and recreation rooms for the women and men. In addition to useful furniture, there are artistic ornaments, musical instruments, libraries and facilities for electrical cooking. The motto of the Company is, "Work with rather than work for."

"Swat the Fly and smash the nose of the man who coughs in your face," is the order of John Dill Robertson, Health Commissioner of Chicago. Other health officials are putting out equally impressive advice, such as "The fly that hatches in the privy may dine at your table." Physicians should be interested to have the importance of fly extermination presented through the local papers at this season, for one female fly now means millions in July.

John T. Black, State Health Commissioner of Connecticut, has planned the capture of 5,000 rats in New London, for a careful study of the possibility of the presence of bubonic plague. Bridgeport is expected to furnish 10,000. The plan contemplates an appropriation of $30,000.

Waste Oil from oil refineries and steamships is said to be responsible for the death of Lightkeeper Luther Tolland, recently. People who use clams should bear in mind that these bivalves may be the vehicles by which poison from waste oil may be a serious danger to life.

The Board of Directors of the American Society for the Control of Cancer has voted to conduct a campaign of education in response to suggestions contained in a letter from Dr. Powers. The executive committee has decided to launch the campaign in the autumn, soon after the Public Health Institute meetings. Subsequent announcements will give the details. Dr. Edward Reynolds is chairman of the Board of Directors, and Dr. Robert B. Greenough is Regional Director for the New England States.

### BOSTON AND MASSACHUSETTS.

Senate Bill 416 provides that an unpaid commission shall be appointed by the Governor to investigate the reasons and causes underlying commitment or admission to any institution under the care or control of the commissions of correction, mental disease, public health, or education, a justice of judicial court, or the parole board, and to recommend legislation or other measures which would tend to decrease the number of persons now in, or who may hereafter be admitted to these institutions. The commission shall report its findings to the Governor not later than the first Wednesday in November.

Senate Bill No. 413 provides for the commitment of an alleged feeble-minded person by a judge of probate, after examination by a physician, to a school for feeble-minded, or to an institution for defective delinquents, or to the custody or care of the Department of Mental Diseases. It is further provided that a parent, guardian or relative of a person so committed may file a petition for a hearing, if the Commissioner of the Department of Mental Diseases discharges such person. The hearing shall be before a probate court, and the petitioner shall pay expense of travel to and from the court. The judge before whom the hearing is conducted shall prescribe the details of proceedings.

Senate Bill 415 provides that the Department of Mental Diseases shall provide for an examination of persons indicted by the Grand Jury for a capital offense, or who is known to have been indicted for any other offense more than once, or to have been previously convicted of an indictable offense and is again indicted by the Grand Jury or bound over for trial, for the purpose of determining the mental condition and the existence of any mental disease or defect which would affect his criminal responsibility. The report of the Department shall be used as evidence before the court and jury.

DR. JAMES A. KEENAN has been appointed to serve as temporary medical inspector in the Boston Health Department, to relieve Dr. Gaetano Prino, who is on leave of absence because of illness.

THE STATISTICAL BULLETIN of the Metropolitan Life Insurance Co., states that diphtheria prevails in a virulent form throughout the country. This would seem to indicate that boards of health in all large cities might properly try to popularize the Schick test and carry on a propaganda of education.

DR. L. VERNON BRIGGS appeared before the Committee on Public Health of the Legislature May 4th, and asked to have the subject of psychiatry added to the list now required by law in the examination of candidates for medical registration. Dr. Briggs contends that medical schools should pay great attention to the teaching of this department of medicine, so that physicians may detect danger signals earlier than is usual at the present time.

FOR THE FIRST THIRTEEN WEEKS of this year the infant mortality rate in New York City is 80 per one thousand born, as against 113 for the corresponding period of last year. This represents a saving of 1132 infant lives. While the Department of Health very fairly says that this decrease in the mortality rate may be due in part to better weather conditions during the winter, and the prosperity of the people, it is felt that the educational propaganda relating to disease has brought about greater appreciation of the need and importance of cleanliness and general hygienic measures, and also to a greater readiness to seek medical advice early. At several Baby Health Stations, the Schick tests are applied free and immunization doses of antitoxin given when indicated. Commissioner Woodward of the Boston City Department of Health, is considering the feasibility of offering the Schick test to the people of his district.

MISS JESSIE A. STOWERS, referred to in the New York papers as "The Angel of the East Side," will leave her position as assistant superintendent of Gouverneur Hospital June 1. After twenty-six years of service, Miss Stowers contends that the explanation of the shortage of nurses lies in the unsatisfactory conditions incident to a nurse's life, and advocates the system of eight-hour duty periods. Massachusetts organizations are hard at work trying to solve the reason for the shortage of nurses. An important conference was held at the residence of Mrs. Nathaniel Thayer, Wednesday, May 4, attended by representatives of hospitals and medical schools, for the purpose of considering means which may be employed to relieve the situation.

WEEK'S DEATH RATE IN BOSTON.—During the week ending May 7, 1921, the number of deaths reported was 2.09 against 2.21 last year, with a rate of *14.39 against 14.25 last year. There were 31 deaths under one year of age against 43 last year.

The number of cases of principal reportable diseases were: Diphtheria, 64; scarlet fever, 42; measles, 110; whooping cough, 18; typhoid fever, 4; tuberculosis, 44.

Included in the above were the following cases of non-residents: Diphtheria, 3; scarlet fever, 3; whooping cough, 2; typhoid fever, 1; tuberculosis, 7.

Total deaths from these diseases were: Diphtheria, 4; scarlet fever, 1; measles, 1; typhoid fever, 1; tuberculosis, 21.

Included in the above were the following cases of non-residents: Scarlet fever, 1; tuberculosis, 1.

* Federal census, 1920, used.

THE HARVARD MEDICAL SCHOOL FACULTY RESEARCH CLUB meets Friday of each week in the Amphitheatre, Building A, Harvard Medical School, 12.30 to 1.30 o'clock. Subjects discussed relate to advance work in medicine. Physicians are invited. Dr. Morton Prince was the speaker May 13th, inst.

STATE DEPARTMENT OF PUBLIC HEALTH.—Final arrangements are now being completed for a demonstration in public health organization to be carried out on Cape Cod, with the assistance of the United States Public Health Service. This demonstration was supposed to go into operation May 16, 1921, and will be carried on for a year. The ten towns listed below have joined forces under the name of the "Cape Cod Health Bureau": Barnstable, Bourne, Brewster, Chatham, Eastham, Orleans, Sandwich, Truro, Wellfleet, Yarmouth.

The corps of workers will consist of a full time health officer, a sanitary inspector, a public health nurse and an office assistant. The nurse and her transportation will be provided by the local Chapter of the Red Cross.

Reports will be made and plans will be subject to approval by the local health boards and the State Department of Public Health, as well as the Public Health Service.

The functions of this staff will be similar to those of a full time health officer and his assistants in a municipality, and they will range from the physical examination of school children to the abatement of nuisances, including the control of communicable diseases, inspection of milk and water supplies, the promotion of child welfare and other clinics in coöperation with established agencies, the inception of maternity and infant hygiene to towns where it is not carried on.

DRS. HENRY I. BOWDITCH AND J. E. HENRY have given lectures in the course at the Jordan Marsh Company Store during Baby Health Week.

CONGRESSMAN TOWNER, who is sponsor for the Sheppard-Towner Bill, providing for maternity care and infant welfare, spoke on his education bill last Thursday evening before the Delta Chapter of the Phi Beta Kappa Society of Tufts College.

## Miscellany.

### AMENDMENT TO THE TOWNER BILL.

So much criticism of the Towner bill has appeared that an amendment submitted by Senator Moses is to be presented to Congress. The Towner bill has been attacked on the grounds that it is loosely drawn and opens the way to the teaching of birth control and sex hygiene.

All of the bills which provide for a subsidy on condition that the state receiving the subsidy shall agree to appropriate a certain sum of money, are open to the criticism that taxation to provide for these bounties will bear heavily on states with large resources in favor of those states less well off financially.

In the proposed Moses bill, the amount contributed by the Federal Government is a small fraction of the amount needed for the creation and maintenance of suitable hospitals, hence one may feel that a state like Massachusetts could much better arrange for all medical hospitals and be free from any obligations to the Government at Washington, for although the proposed measure leaves approval and control to local officials, one can never foretell developments in connection with a system of government bounties.

The JOURNAL presents the proposed Moses measure with the hope that discussion may result:

#### AMENDMENT

Intended to be proposed by Mr. Moses to the bill (S. 1039) for the public protection of maternity and infancy and providing a method of coöperation between the Government of the United States and the several states, *viz.*, Strike out all after the enacting clause and insert the following:

That whenever any county in the United States shall have raised, by taxation or otherwise, a sum not less than $5,000 for the purpose of providing and equipping a county hospital, there shall be paid out of the money in the Treasury not otherwise appropriated the sum of $5,000 to the proper authorities in such county for coöperative aid oı the part of the Federal Government for the providing and equipping of such hospital; and whenever any such county shall provide annually for the maintenance of such hospital there shall be paid on the part of the Federal Government a sum equal to that provided by such county but not to exceed $5,000.

SEC. 2. That such hospitals shall be under the control of the proper authorities of the counties in which they are located, who shall maintain them in a manner satisfactory to the health authorities of the States. In case the standard thus provided shall not be maintained certification thereof shall be made by the State health authorities to the Public Health Service at Washington, and the moneys herein provided to be paid from the Federal Treasury shall be withheld until certification from the State health authorities is made to the effect that the required standard has been attained by the offending hospital.

SEC. 3. That such hospitals shall be especially equipped for and shall give preference to the care of maternity cases and the treatment of children, all such cases, however, to be admitted to such hospitals upon application to and the approval of the county commissioners or similar authorities where boards of county commissioners do not exist.

Sec. 4. That such hospitals shall also provide courses in elementary nursing training not to exceed one year in duration; and candidates for such training shall be selected from the pupils of schools in the county where such hospital is located by means of competitive examination after proper application therefor.

Sec. 5. That the moneys provided by Section 1 to be paid shall be paid upon the certification of the Public Health Service, whose Surgeon General is hereby authorized and directed to employ such assistants, clerks, and other persons in the city of Washington and elsewhere, and to purchase such supplies, office material, equipment and fixtures, and to incur such traveling and other expenses as he may deem necessary for carrying out the purposes of this Act. For the first fiscal year following the passage of this Act there is hereby provided the sum of $10,000 for the purposes enumerated in this section.

Sec. 6. That the sums herein appropriated for hospital work shall be paid in equal semiannual payments on the 1st day of January and July of each year by the Secretary upon the warrant of the Surgeon General of the Public Health Service, out of the Treasury of the United States, to the treasurer or other officer of the county to receive the same: and such officer shall be required to report to the Surgeon General on or before the 1st day of September of each year a detailed statement of the amount so received during the previous fiscal year, and of its disbursement, on forms prescribed by the Surgeon General.

## Correspondence.

### THE HEARING ON TELEPHONE RATES.

*Mr. Editor:—*

The hearing on protest of proposed telephone changes has been held and the decision is awaited. We desire to express our personal thanks to all physicians who through their presence, letters, and moral support made the gathering such a success and aroused the attention of the medical fraternity throughout the state.

The Somerville Medical Society, a band of only seventy men, employed eminent counsel and financed this protest because the time was too short to wait for action by the parent society. We feel that the principle involved in this issue is of too much consequence to physicians to be allowed to be cast aside if a decision should be rendered against us.

We are obliged to request for the above reason that any further action, if thought necessary, shall be taken by the proper officers in the Massachusetts Medical Society at its coming meeting and the responsibility lifted from our shoulders.

The personal opinion of the writer is that the word "physician", contended by the telephone company and apparently concurred in by one of the commissioners, to be an advertisement is not such any more than the red light on the top of a fire alarm post is one. That is not an advertisement, but is a designation of a fact to more easily enable persons to obtain assistance in time of trouble. A motion in the parent society that the telephone company be restrained, or enjoined, by legal process from depriving us of the title so many centuries associated with doctors might not be out of place.

Signed: Protest Committee,
H. E. Buffum, Chairman.

## NOTICES.

Medical Veterans of the World War.—There will be a meeting of the Association of the Medical Veterans of the World War on the day preceding the meeting of the scientific sections of the American Medical Association, the time and place to be announced later. Col. V. C. Vaughan is president of the Association, and Col. F. F. Russell, U.S.A., secretary. All medical officers, contract surgeons of the U. S. Army, and acting assistant surgeons in the United States Public Health Service, who have served in the Medical Corps of the United States Army, United States Navy and United States Public Health Service, and all members of medical examiners of local, medical advisory and district boards, officially appointed by the President of the United States, the Provost Marshall General of the United States Army, and the Governors of the various states are eligible to membership in this organization. The object of this Association "is to perpetuate fellowship, to prepare history, secure coöperation for the mutual benefit of the medical men who served in the World War, 1914-1918, and for the mutual improvement and social intercourse of its members."

Bigelow Medal Address.—Dr. William J. Mayo will give an address entitled "In the Time of Henry Jacob Bigelow," on Monday, June 6, 1921, at half past eight o'clock, Jordan Hall, Huntington Avenue and Gainsboro Street, Boston. On this occasion will be made the first award of the Henry Jacob Bigelow medal. Tickets of admission may be secured by addressing Dr. Walter C. Howe, Secretary Boston Surgical Society, 303 Beacon St., Boston, Mass.

The New England Women's Medical Society will meet on Thursday, May 19, at 8 p.m., at the home of Dr. Bigelow, 14 Warren Square, Jamaica Plain. Speaker: Dr. Anna Quincy Churchill; subject: Heredity, with Special Reference to the Laws of Mendel. Light refreshments will be served.

Alice H. Bigelow, M.D., *Secretary.*

Harvard Medical School Research Club.—The regular weekly meeting of th Research Club was held Friday, May 13, from 12.30 to 1.30. Dr. Morton Prince was the speaker. Subject: The Experimental Study of Hallucinations.

## RECENT DEATHS.

Dr. Franklin Wallace Edwards died April 29, 1921, in Worcester. He was born in Wheeling, West Virginia, graduated from Rush Medical College of Chicago, and practised meany years in Southbridge. He leaves his widow, daughter, and brother, the last, J. G. Edwards of Chicago.

# The Boston Medical and Surgical Journal

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## Original Articles.

### INFRACTION OF THE SECOND METATARSAL HEAD.

By Charles F. Painter, M.D., Boston.

In July, 1920, a boy of seventeen consulted me because of pain in the fore part of his left foot when he walked. He was a student at one of the private schools near the city and while playing baseball, about two months before, injured the foot in sliding to second base. Just what happened, he does not know. It caused him some discomfort at the time, and after the game, he went to the school infirmary, where the foot was bandaged. At the time, there was very little to show for the injury; no ecchymosis or abrasion, some tenderness to palpation about the second metatarso-phalangeal joint and soreness in this articulation when he walked, causing him to limp a little. He kept about on his foot as usual, and when school closed for the summer, shortly after, he went to work on his father's farm, where he engaged in such labor as a husky boy of seventeen would naturally do upon a small farm.

The acute soreness which immediately succeeded the injury subsided to some extent, but did not seem inclined to go wholly away. Because of the persistence of this soreness and the slight but continuous character of the discomfort which he felt in the region above described, and the fact that pressure over the second metatarsal head was painful, he sought advice as to what he had best do. This was about the end of July. When I first examined him, he did not limp in walking, but upon examining the foot and making comparison with the other foot, it was at once noticed that there was a slight amount of swelling about the second, left metatarsal for perhaps a half or three-quarters of an inch along the shaft of the metatarsal, back from the joint, and to a lesser extent on the adjoining phalanx. Firm pressure elicited slight tenderness both on the dorsal and plantar aspects of the joint. There was no redness or increase in the surface temperature. Attempts to move the phalanx passively on the metatarsal were painful, and motion to a normal extent was not possible. There did not seem to be any muscle spasm. There were no other joints involved.

An x-ray examination was made which showed (see Fig. 1) a clearly cut separation of a thin sliver of the cartilage covering the distal articular end of the second metatarsal. The separation was apparently about an eighth of an inch in width. A faint haziness was noted

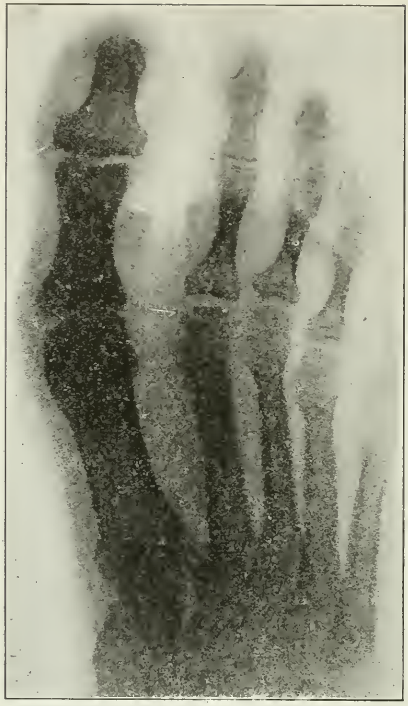

Fig. 1.—Note the separation of the cartilaginous end of the second metatarsal from the shaft of the bone.

between the two fragments. There was no indication of inflammatory exudate about this line of separation between the cartilage and the bone of which it was the terminus. The corresponding joint of the uninjured foot showed no similar appearance. There was slight capsular thickening. There was obviously some sort of discontinuity between the cartilage and the bone and trauma had been definitely associated with the beginning of the symptoms. As I had never seen anything just like it before, I sent the boy home to keep off the foot for two weeks, in order to try the effect of rest and see if any repair would take place under such treatment in a period of two weeks. In the interval, I instituted some investigation as to what the condition represented. Dr. Frederick Cotton remembered that cases of this sort had been reported by Dr. Albert Freiberg of Cincinnati, and reference will be made later to his observation upon the condition. I have adopted the name he has applied to the condition in the title of his communication.

At the expiration of two weeks, I saw the patient a second time and had another x-ray taken. No change had taken place, as revealed by this method of examination, and but little alteration had followed his enforced rest, so far as the physical signs or his subjective symptoms were concerned. It seemed that as long as no tendency had been manifested on the part of nature to repair the damage, that it was probable that no union of the cartilage to the shaft was likely to take place and that it would be advisable to remove the apparently detached fragment.

Under general anaesthesia, through a short dorsal incision opening the capsule of the metatarso-phalangeal joint, this was accordingly done. When the joint was exposed, the condition shown by the radiogram was found to exist. A separation of sufficient width to admit the blade of an osteotome was present, and only a very fragile film of granulation tissue intervened between the cartilage and the end of the metatarsal. There was no comminution of the bone or of the piece of cartilage, and the latter could be lifted out of the joint easily with dressing forceps. After curretting the end of the metatarsal, a capsular suture was placed and the skin incision was closed. A voluminous dressing was applied without splinting.

Convalescence was uneventful, except that there was some leakage of synovial fluid for a week or two after the stitches were removed. Now, November 1, 1920, the foot is symptomless and the patient walks freely and painlessly as much as he chooses. There was not the slightest indication of any attempt to repair, either on the side of the shaft or that of the detached cartilage, except as one may regard the film of granulation tissue as such evidence.

*Case 2. In the early part of November, 1920, a boy of thirteen came to the office because of persistent pain in his right foot. During the preceding July, he had stumbled while running bases and had sudden sharp pain at the base of his second toe. He was taken to Nashua, where two surgeons diagnosed the case as fracture of the head of the metatarsal and placed the foot in a splint. No x-ray was taken. The splint was removed in six weeks, but the

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* I am indebted to Dr. Harold C. Seaver for the history of this case and the details of his treatment of the case.

foot was too painful to allow much walking. He then had a metal splint placed in the sole of his shoe. This splint he has worn to date without any relief from symptoms. The pain is localized over the dorsum of the metatarsal head and is greatly increased by bending the second phalanx in any direction.

Examination of the region reveals no definite objective signs. There is a questionable thickening of the metatarsal head.

X-rays (Fig. II) confirmed the diagnosis of fracture. A small incision was made on the dorsum of the foot, exposing the head of the metatarsal and the adjacent joint. It was found that a line of fracture extended part way into the epiphysis and included the whole cartilage of the joint, except the inferior border. There was no callous formation and no sign of union. The whole fractured portion was removed as a foreign body, and the edges of the epiphysis were smoothed.

In two weeks the boy was walking, with scarcely any limp, and has been slowly improving since.

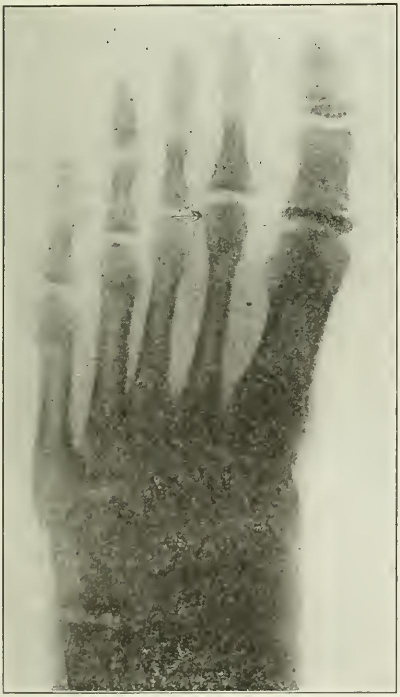

FIG. 2.—The marker shows a crack in the cartilage which extended in to the epiphysis and across to the great toe side, making a loose fragment of the epiphysis.

CASE 3. The patient, whose history is now to be recounted, was not recognized as belonging to this group until some time after the two cases above described had been treated and Freiberg's paper had been called to my attention. It is a particularly interesting case in the light of these other patients, because it shows what happens, or may happen, as a late result of this sort of an injury.

Mrs. F. A. S. (5678), a woman of 60 years, consulted me May 28, 1920, because of an exceedingly painful sensation which she has when walking, referred to the second toe on the left foot. She has been conscious of more or less discomfort, amounting at times to pain, ever since she "stubbed" this toe three or four years ago. At the time, it hurt her a good deal. For the past eight to ten months it has been particularly aggravating, and it has been during this time that she has felt for the first time an enlargement on the inner aspect of this second toe. This was hard, and painful to pressure. She has always been an active woman, doing a good deal about the house, and she has had no arthritis, nor has she suffered from any injury other than that referred to above.

Physical Examination: Fairly developed and nourished woman. At the second metatarso-phalangeal articulation the left foot is considerably thickened, apparently bony in character. This extends forward toward the great toe, on which she has a fairly high-grade hallux valgus deformity. This enlargement is noticeable on inspection, as well as upon palpation. The motion at the joint is painful and restricted mechanically by spasm to about one-half the normal extent.

The x-ray (Fig. III) shows both articular surfaces entering into the joint to be jagged and flared, giving the impression of having been squared off partly by the force causing the original stubbing of the toe and in part as a result of the injury to the cartilage on the two sides of the joint. It suggests that there may have been an impaction of the condyle of the metatarsal into the joint and against the phalangeal cartilage. The space between the bones is greater than normal and the joint surfaces which should be in apposition are not possessed of the usual contours. The phalanx tends to deviate toward the great toe to some extent.

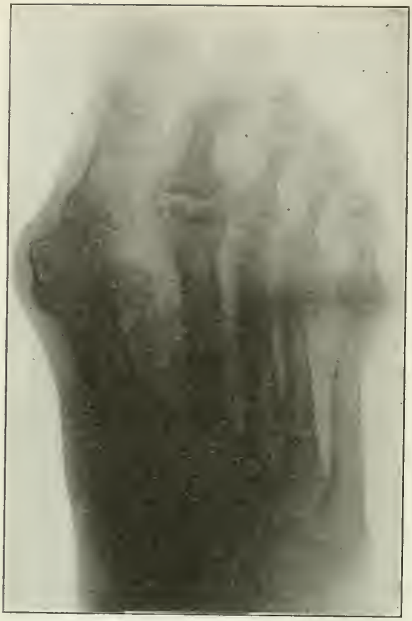

FIG. 3.—Observe the irregularity of the adjoining ends of the second metatarsal and phalanx. The hazy shadow on the side of the second metatarso-phalangeal joint is the extruded cartilage, which had separated from the metatarsal, a later stage of the same condition shown in Figure 1.

Because of the progressive character of her symptoms and the clinical and x-ray findings, she was advised to have an operation to smooth up the articular surfaces.

She was operated upon under general anesthesia on June 3, 1920. A 3½-inch incision was made over the metatarso-phalangeal joint rather to the great toe side of the mid-line of the second metatarsal. The extensor tendons were pulled to one side and the joint opened. What appeared to be a loose piece of bone, the size of a pea, was removed from just beneath the capsule in the line of the incision.

The articular surfaces of both phalanx and metatarsal were flattened; the metatarsal side of the joint had little or no cartilage and the phalangeal side had three or four sharp spicules of bone projecting from the margin of the cartilage. It would appear that the loose piece of bone represented the rounded end of the metatarsal. These bone spicules were removed, it being necessary practically to disarticulate the phalangeal head in order to get at all the roughnesses. The capsule was closed and skin sewed with silk worm gut, after which a dressing was applied. Union was by first intention, and two weeks and two days from the operation she was permitted to put on her shoe and try to get about.

She reported at the office in the course of a month after she had returned to her home. Although she was still a little lame, she was walking very well and had very little pain.

This case appears to represent one of a group of traumatic lesions occurring usually as the result of "stubbing" the toe. For some reason, they are not as often recognized as it would seem that they should be. It is probable that because the disability is not great, they are regarded by the patients as sprains; the majority of them probably take care of themselves and only the ones where separation of the cartilage is complete, seek out the doctor for advice. Some are probably treated as anterior arch trouble or metatarsalgia, and if the treatment is kept up long enough, and the separation of cartilage is not complete, it is as good treatment as if the condition had been more accurately diagnosed.

Now that these cases have been so completely investigated, I feel sure that I have seen others of the same nature, but did not carry their study far enough to have made an accurate diagnosis.

A careful search of the literature in the *Index Medicus* has revealed no further reported cases, except by Skellern, in the *Annals of Surgery*. This was reported clinically in the Proceedings of the Philadelphia Surgical Association. He cited Freiberg's cases and states that these were the first that had been brought to his attention. Freiberg's then stand with the one above referred to, and others by Dr. Campbell of Memphis as the only recorded cases. A personal communication from Dr. Freiberg, a portion of which is quoted, indicates that there are probably more of these than is generally recognized.

"I have your letter of October 28th, and it interests me very much because every now and then I hear of experiences like yours. In 1914, I published a series which I think are akin to yours, in Surgery, Gynecology and Obstetrics,* and I am sending to you a reprint under separate cover. Since the time of this publication, I have every now and then encountered other cases, so that I might perhaps have seen four or five additional cases. Dr. Campbell of Memphis has encountered several cases, and has made a publication on the subject.† He will doubtless send you a reprint upon request. When the A. M. A. met in New York the last time, Hibbs showed two plates of this condition as of unknown character to him, and Campbell happening to be in the audience, was able to tell him something about them."

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* August, 1914.

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† American Journal of Orthopedic Surgery, Vol. xv, No. 10, pp. 721-724.

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# THE IMPORTANCE OF THE PUBLIC HEALTH NURSE IN THE TUBERCULOSIS CAMPAIGN.

BY JOSEPH H. PRATT, M.D., BOSTON.

It is estimated that there are 20,000 consumptives in Massachusetts at the present time. Many of them are dependent on the public clinics and dispensaries for advice and treatment. The diagnosis is made by the doctors, but the details of treatment are largely placed in the hands of the nurses.

Here is a great responsibility and a great opportunity. Dr. John S. Hitchcock has said that 80% of the tuberculosis work properly belongs to the nurses, and I think this estimate is not too high. In my own work among poor consumptives, in the tuberculosis class, I know that the success that has been achieved has been due chiefly to a succession of remarkably able women who have visited the patients and supervised the treatment. Every public health nurse should understand the essentials of successful treatment. Unless she knows the right way of treating the disease, how can she teach the consumptive what he must do in order to recover his health?

The rest method which we have followed for fifteen years is one that is easy to learn and easy to teach. It can be carried out satisfactorily in the home of the patient, and adequate supervision is possible with only occasional visits by the nurse. One must believe in the strict rest treatment himself before he can gain the power of convincing his patients to take it up. At this time I cannot enter into any detailed explanation of the beneficial effect of rest or what it accomplishes, but I urge every tuberculosis worker to procure Dr. Lawrason Brown's "Rules for Recovery from Tuberculosis," and read and study and inwardly digest the chapter on Rest.

There are certain features regarding the disease which a nurse must understand if she is to give wise counsel to the patient and his family. A patient in the curable stage of the malady rarely feels sick. If he accepts his feelings as his guide, he will not take up the bed rest treatment until he has in all probability reached a condition in which recovery is impossible. It is easy to effect improvement by various forms of treatment, but to check the disease permanently is difficult and is rarely accomplished unless a relatively large amount of rest is taken by the patient, and the more complete and prolonged the rest, the greater the chance of permanent recovery.

Patients may improve under forms of treatment that never lead to permanent arrest of the disease. Walshe, the English physician, writing as early as 1854, before anything was known about the effect of rest or out-of-doors life, at a time, in fact, when air artificially warmed was advocated for treatment, said that 68% of the patients whose records he had analyzed, left the Brompton Consumptives' Hospital improved or unadvanced, while 32% left in a worse state than when they entered, or died within its walls. So far as saving life was concerned, this meant little or nothing. The progress of disease was simply checked for a time.

Remember, also, that the progress of the disease is often not continuous in persons with good powers of resistance, but is interrupted with frequent halts, when the disease seems to be checked. This was recognized by Laennec, who spoke of the "false convalescence." The patient has a bad cold and some fever. In a few weeks, the cough is less and the fever gone. He is soon on the streets again and for a time he gains in weight and strength. He is almost well, he thinks; the cough has ceased to trouble him at all. Then he "catches another cold," as he puts it, and the symptoms return. After a time they may disappear again, but he is now thinner and weaker than before. This slow march to the grave is one of the causes of the dread of consumption. The disease, improperly treated, plays with its victim like a cat with a mouse.

Treatment of active pulmonary tuberculosis is never begun too soon, but often too late. If the house is on fire, only a fool would wait to see if it didn't go out of itself before sounding the alarm, and a greater fool is he who waits to see if the tubercle bacilli will not disappear from his sputum by compromise measures if he gives them time, before he makes up his mind to take the proper treatment. Poor patients often say they cannot afford to stop work and take treatment, and I am sorry to say that some physicians accept this argument as convincing when the patient's symptoms and signs, though definite, are slight, and his earning power unimpaired. The poor patient, in this condition, can less afford to delay treatment than the rich consumptive, because with the poor man, loss of pay for a single day, is a serious matter, and hence the greater the need of a speedy return to health. The longer the delay before beginning treatment, the greater is the damage to the lungs, and the longer the period of treatment, the less chance of recovery. If a man with active disease persists in working, after the diagnosis has been made, usually in a few months exhaustion compels him to stop work, because the increasing cough which robs him of sleep, the wasting of flesh, and the fever, all combine to sap his strength. *He finds too late that it would have cost less to get well than to die of pulmonary tuberculosis.*

Too few physicians appreciate yet what can be accomplished by prolonged bed rest in the open air, and too few know that it can check the disease not infrequently when the ordinary out-door treatment has failed. I have used bed rest as the basis of treatment in about 200 cases under my care during the past ten years, and the detailed records I have kept of these cases furnish conclusive evidence of its great value. Even the chronic consumptive, in whom the disease is extensive, but only slightly active, with normal or slightly elevated temperature and slow pulse, who tires quickly, coughs severely, and whose sputum contains tubercle bacilli, has a fair chance of arresting the disease and regaining his wage-earning power, if he will follow the bed rest treatment for a long period—12 to 16 months, or longer. I have several patients who finally recovered after three years of rest treatment, during which exercise was not allowed.

One of the most striking illustrations of the great value of strict rest in the chronic patient, was told to me by Dr. Edward R. Baldwin of Saranac Lake. Years ago, at a time when nothing was known of the curative power of rest, and when the rest treatment was only used when a patient had fever, or was otherwise acutely ill, there was a young man at the Trudeau Sanatorium who had reached a stationary condition. He was an advanced case, with a cavity in his lung and tubercle bacilli in his sputum. He seemed doomed to a life of semi-invalidism. One day, while out tobogganing, he broke both his legs. This turned out to be a most fortunate accident. Weeks of strict rest treatment followed, while the bones were mending. When he finally got up and about, the signs of cavity had actually disappeared and tubercle bacilli could no longer be found in the sputum. He made a good recovery. He is still well and working, and has held for many years a position of trust and importance in Saranac Lake.

If we could induce every consumptive with active disease in this country to go to bed out of doors for six or eight weeks, I am sure that the death rate from tuberculosis would show a substantial drop the very next year. Short as this period is, it is sufficiently long to permit nature to gain eventual mastery of the disease in some cases, even when the patient returns to work immediately afterwards. Intensive treatment of such short duration will, of course, be followed by arrest of the disease in only the more favorable cases; but when it does occur, it furnishes a striking demonstration of the curative power of rest.

Two years ago, Dr. Lawrason Brown and I, in a paper on "Tuberculosis as an Army Problem," reported the case of C. G., discharged from Camp Devens with tubercle bacilli in the sputum and slight signs of disease in the lungs. Two days after his return home, he began bed rest treatment in a corner room—the indoor treatment. I do not endorse it, but it seemed necessary in this case, as he lived in restricted quarters, without yard, or piazza or roof available for treatment. He was kept in bed for seven weeks, except for a weekly trip to the class meeting. Exercise in the form of short walks then began. Against advice, he left the class, and went to work two weeks later. He had gained 24 pounds in eight weeks, the tubercle bacilli had disappeared, the lungs were clear of râles, and he felt strong and well. He has been well and working from February, 1918, until the present time. (He was well in March, 1920.)

So simple is the technique of the bed rest method that I have directed the treatment in some cases by correspondence, with an encouraging measure of success.

One of the first cases in which the correspondence method was used by us was that of Mr. L., who spoke, himself, of the rest treatment at a conference of public health nurses, held two years ago in Boston. In that case, occasional visits were made by Miss Hills, the class nurse, who gave detailed instructions to the patient and the family. The economic and medical difficulties made this case one of especial interest in view of the successful outcome.

There were many discouraging features. The patient lived about twenty miles from Boston, and the little clearing on which he and his family lived in a four-room shack, was several miles from the railroad station. There were seven children, and the oldest was nine years of age. The patient was 35 years old when he entered the class, in 1911, and he had been sick for two and a half years. He had been treated for tuberculosis at a dispensary for a year, but had gained very little. At the time we took up the case, he was much under weight. He had extensive tuberculosis of both lungs; he was raising one-half cupful of sputum a day, and tubercle bacilli were present. He had no money. He was given five dollars a week from the town in which he had previously dwelt. In various ways sufficient money was obtained to support the family. The patient's bed was in a lean-to beside the house. It was opened up to secure plenty of fresh air. He followed the bed rest treatment. Between May and October, the nurse made only five visits. It was a long, hard struggle; but eventually he recovered his wage-earning power. None of the children became tubercular.

He wrote in February, 1917, as follows: "Physical condition has been very good for past two and a half years. Have worked pretty steadily all during that time at general farming, raising all of our own produce, and mostly hand power; also building two dwelling houses, doing stone mason work for cellar as well as carpentry on one (a two-story building). This was in 1915; built second house in November and December, 1916. Sputum examination has been negative for past year and a half." He is now employed as express messenger between New York and Boston, and receives $26 a week.

I believe that correspondence classes could be formed by the State Departments of Health and that it would be the easiest and most inexpensive means of giving instruction and guidance to large numbers of tuberculous patients and an aid to the public health nurses in supervising the treatment of their patients.

No patient should be admitted unless his application for membership was endorsed by his private physician or the dispensary physician. The patient should agree to follow strictly the detailed instructions given by the nurse and by correspondence.

He should begin the rest treatment on entering the class and provide facilities, if he has the means, for taking the bed rest treatment in the open air. The details of the daily life should be entered in a record book, and reports made in writing to the doctor of the class at stated intervals.

The plan would permit of the instruction of a large number of patients at a minimum expense. It would keep the patient in contact with his doctor, the class director should insist that the patient report to his doctor at stated times, for an examination, and that the regular fee should be paid. Such a class would lighten the labor of the overworked nurse and permit of giving every intelligent, conscientious patient a chance to take the form of treatment that offers the most hope or recovery. Even if he lived in a remote village, he would get some supervision from those with experience and he would take heart from knowing that he was not fighting the battle alone and that he had guidance adapted to his special case.

# CEREBRAL HEMORRHAGE OF THE NEW-BORN.

By Frederick C. Irving, M.D., Boston.

Cerebral hemorrhage is undoubtedly the most common cause of death in the first week of infancy. Warwick found it present in 50% of autopsies on the still-born and the new-born, and Spencer in 40%. In over 12,000 consecutive births at the Boston Lying-In Hospital, the diagnosis of cerebral hemorrhage was made in 41 cases, which is about once in 300 deliveries. This figure gives no proper idea of its frequency as only those cases have been considered which were proved by autopsy or in which, during life, the signs of intracranial bleeding were unmistakable. Still-births and deaths from asphyxia, or from unexplained causes, were not included.

Of late years, our notions regarding the causes of cerebral hemorrhage have undergone considerable change. In the older textbooks, the trauma of operative delivery looms large, and in many it is the only etiological factor mentioned. We now know there are at least three ways in which cerebral hemorrhage of the new-born may originate. These are, (1) from intrauterine asphyxia, (2) as one of the many manifestations of hemorrhagic disease of the new-born, and (3) from the trauma of either operative or spontaneous delivery.

Intrauterine asphyxia results from some mechanical obstruction to the foetal circulation. It is not my purpose to take up here the many abnormalities and malpositions of the umbilical cord which may produce this effect, but to call your attention briefly to one factor which is often overlooked, namely, prolonged labor. During labor, we have a retraction of the muscle fibres of the uterine wall, which, if allowed to continue inedfinitely, will result in tonic contraction of the organ. Should the membranes rupture early, this retraction is especially marked. It occurs at the placental site, as well as in the other portions of the uterus, and the result is a slow diminution of the blood supply to the foetus. Impaired oxygenation causes an asphyxia which so raises the foetal blood pressure that cerebral apoplexy is the result. Over 25% of our cases at the Lying-In Hospital had a first stage which lasted over 24 hours. Had this been shortened by appropriate measures, I believe that many of these babies would have been saved. In a number of these cases, alterations in the rate and rhythm of the foetal heart were noted. If the presenting part is allowed to remain too long on the perineum in the second stage, the same condition will result. The forceps have been blamed many times as the cause of cerebral injury, when, had they been used earlier, the injury might have been avoided.

In another 25% of our cases, cerebral hemorrhage was apparently but part and parcel of hemorrhagic disease of the new-born. In these cases, hemorrhages were found in other regions of the body beside the cranial cavity. Moreover, eleven cases of cerebral hemorrhage followed normal or precipitate delivery, and one followed Caesarean section. In none of these was the trauma of delivery or asphyxia present. We are, therefore, led to the conclusion that these cases were due to hemorrhagic disease, since the other two causative factors were lacking.

The trauma of delivery may cause rupture of the cerebral vessel with resulting extensive hemorrhage. Compression exerted by forceps applied to an unfavorable diameter of the foetal head, as well as the sudden change in intracranial pressure when either the forecoming or the aftercoming head is violently pulled through either the superior or the inferior strait, may result in much damage. I believe that the only safe application of forceps is over the sides of the baby's head. In this case, when a properly designed instrument is used and there is no disproportion between the head and the mother's pelvis, the forceps tends to protect the skull rather than to damage it. In one of our cases, a massive hemorrhage resulted from rupture of the superior longitudinal sinus caused by excessive over-riding of one of the parietal bones. The patient was a multipara in very active second stage, with the head at the vulva. While the house officer was scrubbing up, the nurse restrained the presenting part, with the result that the baby died next day. Autopsy showed a good-sized rent in the sinus.

Post mortem reveals all degrees of hemorrhage from the small punctate areas over the surface of the brain, to the massive variety which may cover one or both sides of the convexity of the cerebrum or may be localized in the subtentorial region. Often it is difficult to find sufficient cause of death, as was the case in one infant where nothing was made out but a small clot in each lateral ventricle. On the other hand, the hemorrhage may be so extensive that it is remarkable that the baby lived at all.

In the cases associated with hemorrhagic disease, we find, in addition, hemorrhages in many parts of the body: the gastroenteric tract, the cortex of the suprarenal capsules, the kidneys, of bleeding from the navel, from forceps and the subcutaneous tissue, hemothorax, hemoperioperation wounds—notably circumcision—and even from needle pricks.

The diagnosis of cerebral hemorrhage of the new-born is a matter of the greatest importance. The immediate mortality is excessively high, in our series 95%, both with and without operation. Since these children, should they survive the first few days of life, are very apt to become the victims of cerebral paralyses or degenerate into hopeless idiots, it is absolutely necessary that the condition should be recognized immediately and every attempt made to prevent such a disastrous outcome. These babies, in the early hours or days of life, exhibit certain peculiarities which should not fail to attract the attention of the physician. They may have recurrent attacks of cyanosis and apnoea, often without any other visible abnormality. As was pointed out some years ago, by Dr. R. M. Green, this is especially apt to be the case in the subtentorial hemorrhage, where the extravasated blood causes an increase of pressure on the medulla and results in respiratory symptoms. In these cases, lumbar puncture will reveal bloody spinal fluid, and often the condition of the child will improve strikingly, for a time at least, upon the relief of pressure by this procedure. One of our cases was, so far as we know, cured by repeated lumbar punctures. It left the hospital in good condition and was normal in every way four months later.

In other cases, there is little to be noted at first, except that the child does not seem quite right. It refuses to nurse and often has a characteristic, continuous and monotonous cry. Sometimes, on the contrary, it lies quietly and is difficult to arouse. As time goes on, mystagmus, inequality of the pupils, twitching, convulsions and spacticity of the extremities develop, and there may be retraction of the neck or opisthotonous. The anterior fontanelle is apt to show a varying degree of bulging, depending upon the degree of intracranial pressure. In massive hemorrhages, pallor is a striking sign. Oedema of the face rarely occurred in our series. There may be protrusion of one eyeball, or both. The temperature may be markedly elevated, or it may be subnormal, or show no change whatever. The heart-beat is usually slow and forceful.

If there is any question of intracranial hemorrhage, a lumbar puncture should be done. The anterior fontanelle may also be aspirated with a needle and syringe, avoiding the midline under which lies the superior longitudinal sinus. Naturally this procedure will be negative unless the extravasated blood lies beneath. The coagulation and bleeding time should be determined by Rhodda's method, and if they are prolonged, or if hemorrhages are apparent in other regions of the body, repeated subcutaneous injections of about 30 cc. of whole blood should be made on the assumption that the intercranial bleeding may be due to hemorrhagic disease. In our experience, transfusion has only hastened the fatal termination, since the rise in blood pressure which results from it has only increased the hemorrhage. Should the diagnosis of intracranial hemorrhage be made, a surgeon skilled in the treatment of cerebral injuries should be called immediately in consultation. Our cases which have been operated on have done very badly. In all of them, except one, either an extensive bone flap operation was done or the anterior fontanelle was opened. Should these infants survive the operation, which is rare, hydrocephalus or hernia cerebri is very apt to result. In one case, the coronal suture on one side was opened for a few centimeters and a rubber tissue drain inserted. This infant left the hospital apparently well, but was lost tract of. The operation which seems to offer the most hope is the subtemporal decompression. The surgeon's effort should be solely to relieve tension. Search for bleeding points, except when there has been a tear in a single large vessel, such as the superior longitudinal sinus, will be fruitless and a waste of valuable time.

In this condition prophylaxis is all important. The foetal heart should be under close observation during the entire first and second stages, and the obstetrician should stand ready to terminate labor, should it show any alarming variation. Since a number of our cases occurred when the first stage lasted over 24 hours, we have come to view inertia, or lack of progress, with apprehension, and often hasten dilatation by means of the Voorhees bag or by partial manual dilatation under light anesthesia. In none of our cases of cerebral hemorrhage had pituitrin been used. This drug has been employed very little at the Lying-In Hospital and never in larger than three minim doses. Although cerebral injury following its use has been reported from other clinics, it is only fair to say that they have followed larger doses injudiciously used. We have had no bad results following its use in small doses, when the presenting part has been well in the pelvis and dilatation well under way. In the second stage, we do not allow the head to remain on the perineum for over an hour. At the expiration of this time forceps are applied and the infant extracted. We do not believe that we are subjecting the child to any risk from this procedure, but that, on the other hand, we are taking all possible measures to protect it from injury.

# THE ESSENTIAL FACTORS OF CANCER CAUSATION.

By James W. Shannon, M.B., San Diego, Calif.

(Continued from page 512.)

There are certain large areas in this country which, because of the contrasts in their physical features, and also because of the size and uniformity of the populations which they include, are, perhaps, better calculated to exhibit the relation of water to cancer than other parts of the civilized world. They are as follows:

1. *The New England Region.* This comprises the states of New England, together with the state of New York. The most prominent feature of the landscape is the *extraordinary number of lakes,* mostly of small or medium size, which are distributed throughout the greater part of this region with considerable regularity. Altogether these states (excluding New York) cover an area of 66,424 square miles, of which 4,448 square miles, or approximately one-fifteenth part, consist of water. By reason of such enormous quantities of *stagnant water,* the conditions throughout this region are favorable in the highest degree for *the development of protozoal organisms in maximum numbers.*

2. *The Mississippi Valley Region.* In this are included states lying between the Appalachian range of mountains in the east and the Rocky Mountains in the west. Its characteristic features are *level prairie lands of vast extent,* and a *system of great rivers, all of which with their numerous tributaries tend to flow sluggishly.* These conditions correspond to a *development of protozoal organisms in moderate numbers only.*

3. *The Rocky Mountain Region.* This includes states situated on the slopes or plateaus of the Rocky Mountain range or the extensions thereof. The great height of the mountains, and the fact that at the summit they are covered with snow during the whole or greater part of the year, implies not only *rapidly flowing streams and rivers,* but also *abundant supplies of water of the highest purity.* Under the conditions present in this region *protozoal organisms tend to develop only in mimimum numbers.*

4. *The Appalachian Region.* This comprises states which throughout the whole or any great part are traversed by the Appalachian range of mountains or its extensions. With regard to water and the development of protozoal organisms the conditions herein are similar in all essential points to those in the Rocky Mountain region.

Having thus gained a general idea of the character of the water-supplies to which populations are exposed in each of these regions, we are in a position to determine whether or not the prevalence of cancer corresponds with the development of protozoal organisms in each of the aforementioned classes of water. For this purpose, the facts contained in the *Mortality Reports of the United States Bureau of the Census* are sufficient. The figures hereinbelow are from the most recent report available, namely, that for the year 1917. They represent the mortality rates of cancer in each state of the U. S. Registration area, and for convenience are arranged in order of cancer mortality and in groups, as follows:

Mortality Rates per 100,000 of Population from Malignant Tumors in Each State of the U. S. Registration Area during the Year 1917.

| | | Mortality Rate per 100,000 |
|---|---|---|
| | *U. S. Registration Area* | *81.6* |
| 1 | Massachusetts | 108.3 |
| | Vermont | 107.7 |
| | Maine | 105.9 |
| | New Hampshire | 105.3 |
| | (California) | (105.1) |
| | Connecticut | 95.7 |
| | Rhode Island | 95.4 |
| | New York | 93.6 |
| 2 | Ohio | 91.8 |
| | Maryland | 90.0 |
| | Indiana | 89.8 |
| | Michigan | 89.0 |
| | New Jersey | 83.9 |
| | Minnesota | 83.7 |
| | Wisconsin | 83.5 |
| | Pennsylvania | 78.9 |
| | Missouri | 73.9 |
| | Kansas | 67.9 |

| | | |
|---|---|---|
| 3 | Colorado | 63.1 |
| | Montana | 58.8 |
| | Washington | 58.6 |
| | Utah | 53.4 |
| 4 | Kentucky | 53.8 |
| | Virginia | 53.3 |
| | Tennessee | 46.6 |
| | North Carolina | 43.0 |
| | South Carolina | 36.8 |

Perhaps the most impressive feature in this table is the manner in which the states, when arranged in order of their cancer rates, form groups which, as far as is possible, are geographically correct. Thus, the states in the first group (with the exception of California) all lie in the northeastern section of the country; those in the second, in the middle section; those in the third are all western states, while the states of the fourth group are all in the southeast. Lest it should be thought that this is merely a matter of chance, and is therefore without significance, it may be well to realize that the records of cancer mortality show that though the position of states may vary within a group, yet the groups themselves are each year substantially the same. It has never happened, for example, that any state belonging to the higher groups has appeared in the lower groups, or *vice versa*. The only instance of overlapping occurs exactly where it might have been expected, namely, between the states of those groups which in common are associated with the same physiographical characters, *i.e.*, between the lowest member of the third group and the highest member of the fourth (Utah and Kentucky, respectively), both of which groups have one prominent feature in common, namely, mountains of great height.

The high cancer rate of California is due less to the physical features of the country than to the fact that an unusually large proportion of its population lives in the cities, and also that, because of the scanty and uncertain rainfall throughout a large part of the state, it is necessary, in order to provide against a failure of the supplies, to store water in quantities sufficient for the needs of the population during long periods of time. Thus it happens that, whereas the populations of the other states in the first group are exposed to water which, by reason of the conditions natural to that part of the country, is stagnant, the population of California is exposed to water which, because of artificially created conditions, is also stagnant. Hence there is a peculiar significance in the fact that though, with respect to its physiography or geographical situation, there is nothing in common between California and the other states in the first group, yet it serves, equally with them, to demonstrate the association of stagnant water with a high cancer rate.

The value of the foregoing figures consists partly in the precise information concerning the distribution of cancer which they supply, but, above all, in the manner in which they serve to establish the relation of cancer to the the physical features and the character of the water-supplies in each part of the country. To realize this, it is necessary to remember that, in a previous paragraph, certain large areas were distinguished as: (1) The New England Region, (2) The Mississippi Valley Region, (3) The Rocky Mountain Region, and (4) The Appalachian Region; that the first was characterized by a large number of lakes; the second by sluggish rivers; and the third and fourth by rapidly flowing rivers or mountain streams. If now we study the facts of cancer distribution as they are represented in the foregoing table, we shall find that, with the exception of California, all the states *when arranged in order of cancer prevalence, form groups which are practically identical with the grouping of the same states when classified according to their physical characters.* Thus, the first group in the table corresponds to the New England Region; the second, to the Mississippi Valley Region; and the third and fourth, to the Rocky Mountain and Appalachian regions, respectively. Having regard, then, to the fact that the number of protozoal organisms present in the water supplies varies in accordance with the physical features of each region, it follows, that since the prevalence of cancer corresponds with the physical features of a country, it must, in an equal degree, also correspond with the class of water present therein. Hence the first group of states corresponds with that class of water which contains the maximum number of protozoal organisms, *i.e.*, stagnant water; the second, with that class which contains medium numbers, *i.e.*, sluggishly moving or semi-stagnant water; and the third and fourth, with the class containing minimum numbers, *i.e.*, rapidly flowing water. Since, then, the evidence pertaining to the distribution of cancer in the United States points only in the direction of an association or connection between each degree of cancer prevalence and a corresponding class of water and number of protozoal organisms, we cannot reasonably refuse to accept the conclusion that water and protozoal organisms are essential to the causation of the disease.

Of not less importance, with respect to its bearing on the problem of cancer causation is the fact that the prevalence of the disease varies according to latitude and temperature. Figures compiled and published by Dr. Frederick L. Hoffman, in a work entitled, "The Mortality from Cancer Throughout the World," show that with increasing distances north or south of the equator the rate of cancer mortality becomes regularly higher. Dr. Hoffman's statistics are in part as follows:

MORTALITY FROM CANCER IN CITIES, ACCORDING TO LATITUDE AND TEMPERATURE, 1908-1912.

| No. of Cities | Degrees of Latitude | Mean Annual Temperature | Rate per 100,000 Pop. |
|---|---|---|---|
| 35 | 60 N.–50 N. | 48.0° | 105.7 |
| 48 | 50 N.–40 N. | 50.3° | 92.4 |
| 24 | 40 N.–30 N. | 58.5° | 78.1 |
| 7 | 30 N.–10 N. | 72.5° | 42.3 |
| 4 | 10 N.–10 S. | 74.6° | 40.9 |
| 7 | 10 S.–30 S. | 65.9° | 37.7 |
| 5 | 30 S.–40 S. | 62.7° | 89.8 |
| 130 | | | 91.0 |

Since it is obviously impossible that the connection, shown in this table, between cancer and latitude, could exist except through the action of temperature, it is sufficient for the present to confine our attention to a study of the relation of temperature to the distribution of cancer. Inasmuch, then, as the figures show that cancer prevails in a maximum degree in temperate and cold climates, and in a mimimum degree in tropical regions, we are warranted in concluding that high temperatures exert an inhibitory or restraining influence upon the causation of the disease. It is therefore necessary to study the problem from the viewpoint of the action of temperature upon water and the organisms contained therein.

We have already had occasion to observe that among the conditions which favor the development of protozoal organisms exposure to sunlight is one of the most important. Other things being equal, maximum exposure to sunlight implies a maximum development of protozoal organisms, and consequently, we should expect to find that their numbers were greater in tropical waters than in the waters of colder climates. Observation has shown, however, that exactly the reverse is true; that the density of organic life reaches its maximum in the waters of cold climates and its minimum in the warm waters of tropical regions. This is explained by the fact that increase of temperature lowers the viscosity of water, and that protozoal organisms cannot thrive except at the surface. Being unable to maintain themselves at the surface in waters of low viscosity, their numbers must therefore tend to become fewer as the temperature of the water increased. In dealing with this point, Professor G. C. Whipple, in his work, "The Microscopy of Drinking Water," states: "The viscosity of water has an important influence upon microscopic organisms, as it materially affects their flotation It also affects the sedimentation of fine particles in water and even the circulation of the water itself. Viscosity varies with the temperature. It is twice as great near the freezing-point as at ordinary summer temperatures."

Since it is thus apparent that increase of temperature results in lowered viscosity of water, diminution in the numbers of protozoal organisms, and inhibition of the prevalence of cancer, it is obvious that the relations between water, protozoal organisms, and cancer, must be direct, and that all three vary inversely with temperature. In the light of this, the foregoing figures can only be interpreted to mean that in all latitudes the prevalence of cancer corresponds with the numbers of protozoal organisms; hence their significance in regard to the rôle of water and protozoal organisms in the causation of cancer has the value of independent proof.

Another of the problems of cancer causation is that which deals with the relations of protozoal organisms to pathogenic bacteria in water, and also with the relations of cancer to certain water-borne diseases, especially to typhoid fever. Although it is generally agreed that typhoid fever (*i.e.*, water-borne cases) prevails in proportion to the numbers of typhoid bacilli present in the water supplies, yet it is by no means necessarily true that the prevalence of typhoid fever always corresponds with water supplies in which the opportunities for contamination are the greatest. The truth is that, as in the case of protozoal organisms, typhoid bacilli naturally tend to disappear from certain classes of water and to multiply in others; but, whereas the maximum numbers of protozoal organisms are associated with stagnant waters exposed to sunlight, and the minimum numbers with ground waters protected from sunlight, the maximum number of typhoid bacilli correspond with waters of the latter, and the minimum numbers with waters of the former class. Protozoal organisms thrive in sunlight while typhoid bacilli tend to disappear, but, in addition to the antagonism thus determined, there is also an antagonism resulting from the natural propensity of protozoal organisms to prey upon typhoid bacilli and other bacteria in water. In discussing this, Professor Whipple, in the work aforementioned, says: "More recent experiments by Emmerich have indicated that certain Protozoa exercise a similar purifying effect on surface waters. He has found that two species of the genus Bodo will greatly reduce the number of typhoid-fever germs in water. Staining of the organisms shows that the bacteria are absorbed by the animal-cell, the action being analogous to that of the white-blood corpuscles in the human body upon which Metchnikoff's theory of phagocytosis was based. Emmerich considers that these and other Protozoa play an important part in the self-purification of streams. . . . . Strohmeyer, at Hamburg, made some interesting laboratory experiments showing how growing Enteromorpha influenced the number of bacteria of the water placed in direct sunlight and in diffused light. Thus in diffused light he obtained the following results:

| | | No. of Bacteria per c.c. | |
|---|---|---|---|
| Date | Time | Enteromorpha Present | Enteromorpha Absent |
| July 4 | 11.30 A.M. | 145 | 108 |
| " 4 | 2.00 P.M. | 160 | 144 |
| " 4 | 6.00 P.M. | 152 | 243 |
| " 5 | 8.30 A.M. | 1,100 | 5.900 |
| " 5 | 2.00 P.M. | 180 | 26,000 |
| " 5 | 6.30 P.M. | 7 | 50,000 |
| " 6 | 9.00 A.M. | 24 | 63.000 |
| " 6 | 7.30 P.M. | 0 | 80,000 |

The conditions which give rise to such antagonisms between different species of organisms must, in the case of those which are pathogenic, be reflected upon the diseases corresponding therewith. Consequently, if protozoal organisms are the cause of cancer, and typhoid bacilli of typhoid fever, we may expect to find the same antagonism between cancer and typhoid fever as that which has been shown to exist between their respective causes. In a general way there is evidence of such an antagonism in the fact that the marked decline in the prevalence of typhoid fever since the beginning of the present century has been regularly accompanied by an equally marked increase in the prevalence of cancer; and also in the fact that, whereas in cities—the water supplies of which are generally favorable to the development of protozoal organisms and unfavorable to typhoid bacilli—the rate of cancer incidence is found at the maximum, and of typhoid fever incidence at the minimum, in rural communities—which for the most part are supplied from wells, springs, streams, and other natural sources favorable to typhoid bacilli and unfavorable to protozoal organisms—exactly the opposite is true; that is to say, the rate of cancer incidence is found at the lowest, and of typhoid fever incidence at the highest point. Though these facts possess a significance which cannot be ignored, yet it is only by a study of the statistics pertaining to cancer and typhoid fever that the antagonistic character of the relation between them is fully revealed. Such a study is possible wherever reliable statistical data covering large areas of population are available. The figures hereinbelow are taken from the *Eighteenth Annual Report of the U. S. Bureau of the Census:* they show that the mortality rates of cancer and typhoid fever throughout the U. S. registration area during the year 1917 were as follows:

MORTALITY RATES PER 100,000 OF POPULATION IN THE STATES OF THE U. S. REGISTRATION AREA DURING THE YEAR 1917. ARRANGED IN ORDER OF CANCER MORTALITY.

| Name of State | Cancer | Typhoid Fever |
|---|---|---|
| *U. S. Registration Area* | *81.6* | *13.4* |
| Massachusetts | 108.3 | 4.8 |
| Vermont | 107.7 | 6.9 |
| Maine | 105.9 | 10.5 |
| New Hampshire | 105.3 | 6.1 |
| California | 105.1 | 7.2 |
| Connecticut | 95.7 | 9.3 |
| Rhode Island | 95.4 | 5.4 |
| New York | 93.6 | 5.6 |
| Ohio | 91.8 | 13.3 |
| Maryland | 90.0 | 18.6 |
| Indiana | 89.8 | 17.5 |
| Michigan | 89.0 | 12.6 |
| New Jersey | 83.9 | 6.7 |
| Minnesota | 83.7 | 4.3 |
| Wisconsin | 83.5 | 5.2 |
| Pennyslvania | 78.9 | 10.4 |
| Missouri | 73.9 | 20.4 |
| Kansas | 67.9 | 17.7 |
| Colorado | 63.1 | 9.4 |
| Montana | 58.8 | 16.7 |
| Washington | 58.6 | 7.6 |
| Kentucky | 53.8 | 31.9 |
| Utah | 53.4 | 13.3 |
| Virginia | 53.3 | 21.1 |
| Tennessee | 46.6 | 38.2 |
| North Carolina | 43.0 | 29.9 |
| South Carolina | 36.8 | 31.8 |

Were it not that these figures include cases of typhoid fever having their origin in infected media other than water, it is practically certain that the character of the relation between cancer and typhoid fever would appear to even greater advantage. Notwithstanding this, the table shows that the antagonism between cancer and typhoid fever which we had reason to expect is an actual fact. Having regard, then, to the relation between protozoal organisms and typhoid bacilli on the one hand, and to this relation of cancer to typhoid fever on the other, it becomes virtually certain that the antagonism between cancer and typhoid fever corresponds with, and is a reflection from, the antagonism existing between protozoal organisms and typhoid bacilli. Hence it follows that the position of cancer with respect to protozoal organisms is the same as that of typhoid fever towards typhoid bacilli, and inasmuch as it is an established fact that the relation of typhoid bacilli to typhoid fever is one of cause and effect, we must, for the above-mentioned reasons, believe that the relation between protozoal organisms and cancer is one of cause and effect also.

For the purpose of the cancer problem, it is unnecessary to discuss further the reasons for the decline of typhoid fever prevalence, but inasmuch as the foregoing conclusions conflict to some extent with the opinions prevailing at the present time, it seems desirable to point out that, in view of the relations between protozoal organisms and typhoid bacilli and also between cancer and typhoid fever, no explanation of the decline in typhoid fever prevalence can be regarded as entirely satisfactory which does not at the same time account for the increased prevalence of cancer. Though it is not disputed that the measures designed to render water-supplies free from typhoid bacilli have contributed to the decline of typhoid fever prevalence, yet, it should not be forgotten that protozoal organisms are a powerful agency acting in the same direction. In estimating the value of measures designed for the prevention of typhoid fever, it is necessary, therefore, to realize, firstly, that all water-supplies are not equally liable to contamination with typhoid bacilli, and, secondly, that the conditions in all are not equally favorable to the development of protozoal organisms. Preventive measures will, therefore, appear to advantage in cases in which either the opportunities for contamination with typhoid bacilli are few or the conditions for the growth of protozoal organisms are favorable, and at a disadvantage under circumstances the opposite of these. An excessive degree of contamination, or a scarcity of protozoal organisms may therefore render the most efficient measures of prevention apparently of no effect, while, under the reverse conditions, the same, or even inferior, measures may appear to be highly successful. Consequently, a low rate of typhoid fever prevalence does not necessarily imply that the measures of prevention used were superior to those employed in cases of high typhoid fever prevalence. The rate of typhoid fever mortality per 100,000 population, for the year 1917, in Boston, Mass., for example, was 3.0, while the corresponding rate for Memphis, Tenn., was 25.0, and from the viewpoint of these figures only, it would therefore appear that the system of typhoid fever prevention used in Boston was more efficient than that employed in Memphis. The matter assumes a different aspect, however, when it is realized that, whereas the water-supplies of Boston are drawn from the impounded waters of large reservoirs and are therefore likely to contain large numbers of protozoal organisms and correspondingly few typhoid bacilli, the source of supply at Memphis is the famous system of artesian wells in which, by reason of the relative absence of protozoal organisms, there is comparatively little restraint upon the multiplication of typhoid bacilli. The truth, therefore, seems to be that the low rate of typhoid fever prevalence in Boston is due partly to the employment of measures designed to prevent contamination, and partly to the restraining influence of protozoal organisms, and that the responsibility for the high rate of typhoid fever prevalence in Memphis rests, not upon the absence of efficient measures of prevention, but upon the relative absence of the check which protozoal organisms exert upon the growth of typhoid bacilli. This view of the matter is fortified by the fact that for the period aforementioned the rates for cancer mortality in Boston and Memphis were 120.5 and 75.7, respectively.

There is no question so serious, or which, by reason of the loss of life which it entails, more urgently demands attention than the progressive increase of cancer prevalence. During the period 1900-1917, the mortality rate of cancer in the U. S. registration area rose from 63.0

to 81.6—an increase of approximately one-third. In other words, there were, in the year 1917 four deaths due to cancer for every three from the same cause at the beginning of this century. This tendency on the part of cancer to increase exists in practically all civilized countries, but it has not been observed among peoples living under primitive or uncivilized conditions; hence we may surmise that it is a result of influences peculiar to a civilized state of existence.

In attempting to understand the reasons for the progressive increase of cancer prevalence, it is necessary to realize, firstly, that the rate of cancer incidence is always higher upon urban than upon rural populations, and, secondly, that whereas, with few exceptions, urban populations are exposed to one class of water only, namely, the stagnant waters of reservoirs, rural populations draw their supplies from wells, springs, lakes, rivers, streams, and other natural sources. Having regard, therefore, to what has already been said concerning the relation of stagnant water to the prevalence of cancer, it is obvious that so long as the water-supplies of urban and rural populations remain as they are at present, the rate of cancer incidence upon the former must be higher than upon the latter, and for the same reason cancer must prevail in a higher degree among civilized, than among primitive people.

From the foregoing, it follows that the prevalence of cancer must tend to increase as the urban population becomes greater and the rural population less, or to decrease according as the urban population becomes less and the rural population becomes greater. Consequently, it is a matter of great importance that, whereas formerly the rural population was greater than the urban, exactly the opposite is true at the present time. The census of 1920 shows that the population of the United States consists of 105,683,108 persons, and that, of this number, 54,816,209, or 51.9 per cent., live in cities. In discussing the changes which have taken place in the character of the population, the Director of the U. S. Census Bureau says: "The figures of the present census also show that the trend of population from the country to the city has become greatly accentuated since 1910 and that for the first time in the country's history more than half the entire population is now living in urban territory as defined by the census bureau. That is to say, of the 105,683,108 persons enumerated in the fourteenth census, preliminary tabulations show that 54,816 209, or 51.9 per cent., are living in incorporated places of 2500 inhabitants or more, and that 50,866,899, or 48.1 per cent., in rural territory. In the census of 1910, the corresponding percentages were 46.3 and 53.7, respectively, showing a loss of 5.6 per cent. in the proportion of the population living in rural territory.

"To show more clearly the change in the proportion of the population living in rural territory now, as compared with ten years ago, the rural population can be divided into two classes, namely, 9,864,196, or 9.3 per cent., of the total population living in incorporated places of less than 2500 inhabitants and 41,002,703, or 38.8 per cent., of the total population living in what may be called purely country districts. At the census of 1910, the population living in incorporated places of less than 2500 inhabitants formed 8.8 per cent., while the population living in purely country districts formed 44.8 per cent. of the total population."

Since any increase in the proportion of population living in cities necessarily implies the exposure of larger numbers of persons to the class of water which, beyond all others, is most potent in the causation of cancer, it is virtually certain that so long as the urban population continues to increase at the expense of the rural, and the present habits and customs with respect to the use of water remain unchanged, the menace of cancer will become more and more serious.

Though, as a general rule, the rate of cancer prevalence must always be lower in rural than in urban populations, yet, by reason of the intercourse between them, the risks to which the latter are exposed cannot fail to be reflected to some extent upon the former. The course of travel is towards cities rather than in the opposite direction, and in so far as motor vehicles, railways, and other travelling facilities have tended to a greater exposure of the rural population to city water-supplies they have to that extent been instrumental in increasing the rural rate of cancer prevalence.

It has already been stated that a preëxisting lesion is an essential factor in the causation of cancer and also that the site of every cancer is determined by such a lesion. Inasmuch, however, as cancer does not necessarily appear most frequently in those organs or parts of the body which are most frequently the seat of lesions, but shows a disposition to attack certain limited areas in a manner which is disproportionate to their size or importance, it becomes a problem to determine why lesions in general, and lesions of these parts in particular, should depart from their regular course in order to become cancerous.

*(To be continued.)*

## Selected Article.

### PUBLIC HEALTH CONSIDERATIONS RELATING TO INFLUENZA, PNEUMONIA, AND ALLIED EPIDEMICS.—THE EPIDEMIOLOGICAL POINT OF VIEW.*

By F. G. Crookshank, M.D., F.R.C.P., London,

*Physician to the French Hospital and St. Mark's Hospital, London.*

Although I have had the advantage, in the past, of working for some years as a medical officer of health, I propose now to approach the topic chiefly from the point of view of a clinician who is interested in epidemiology and the historical records of pestilence.

We speak a great deal nowadays concerning influenza. We are all deeply interested in its control: we all realize its devastations: but how many of us are prepared to say what we mean by "influenza"?

Yet, unless we have clear ideas as to what we mean, how can we hope to formulate rational schemes for the mitigation of its ravages?

I have recently attempted elsewhere to elucidate our conceptions of epidemic disease at greater length and in more technical language than would be here possible or suitable; but I would point out that we have come, through sheer intellectual laziness, to speak as if special diseases were objects of natural history, like lions and tigers, that ought to be destroyed, but that still make onslaughts upon us, from time to time, without other justification than their inherent wickedness and hatred of mankind. We have come, moreover, to look upon the causal bacillus, known or unknown, as the material expression of the disease; and we seem to imagine that the disease exists, in perpetuity, hidden in Siberia or elsewhere, whence it emerges from time to time to wreak havoc amongst the peoples of Europe and America.

All this is very wrong and very careless, for special diseases exist only as general notions, or conceptions, which we form concerning definite types of disordered health, in respect of which certain causes play a definite part. To speak then of the recurrent epidemics we call influenza as repeated invasions of the same disease can only be true in the limited sense that the war lately concluded was the same war as that of 1870; or the recent fighting in Derry the same rioting as that of 1688. In each case certain like, or even identical causes were partly responsible for the disturbances produced in particular localities, but that is all.

The facts are that, just as the populations of continents or of countries are from time to time agitated by the organized disorder of social and political life that we call war, so these are also, from time to time, sufferers from those disorders of the life of communities that we call epidemics, or pestilences.

And, just as from critical or analytical motives we classify the *kinds* of war we observe, as civil war, war of rebellion, war of empire and the like, so do we speak of certain kinds of disorder of the public health as plague, cholera, and influenza.

But, just as war, revolution, and riot, do not exist in nature as things, so there is nothing with external existence or objectivity which makes its appearance from time to time and to which we can apply the term influenza.

It is idle, therefore, to discuss whether or no the influenza of 1918-19 was the same thing as the influenza of 1889-90. The phenomena are comparable, but there are differences, as well as resemblances, in form, as well as in causation.

Now the bacteriologists are not more free from blame than are the physicians. They, finding certain bacilli to be generally the immediate agents in particular *cases* during an epidemic, declare these bacilli to be the cause of the *epidemic;* a position as illogical as to declare that bullets and poison gases were the cause, not merely of deaths during the late war, but of the war itself. The bacteriologists evidently forget the complexity of causation, and forget, too, that, however important from the point of view of the pathologist may be the exact nature of this or that bacillus in this or that form of disease, the real problem before the epidemiologist is to make out the nature of the factors that favor the propagation and dissemination of these special microörganisms at periodic intervals.

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We, then, who are concerned to prevent, if possible, the vast epidemics that we call influenza, amongst others, must study the ultimate causes of these periodical disorders of the health of communities, just as the intelligent statesman, who would prevent war, should be less occupied with problems of artillery than with the causes that lead to conflicts.

The point of view of the epidemiologist differs from that of the statesman, from that of the soldier. The physician and the soldier occupy themselves, during epidemics and wars, with counter attack, and the protection of individuals and lesser units of communal organization: the epidemiologist and the statesman must take a wide view in their respective spheres of interest, and must deal with origins.

Our business, then, is to enquire why pestilences occur; to seek a way, if way there be, of foretelling their imminence; and to consider how far they may be prevented or modified by the means at our command.

The inoculation, for example, of individuals during an epidemic, and the adoption of measures to limit contagion, are undoubtedly valuable; but they can no more *prevent* a pandemic of influenza than can gas masks and steel helmets *prevent* a war.

But, if the historic and epidemiologic methods of enquiry be pursued, even though they involve mental exercises abhorrent to the laboratory worker, we may hope to arrive more clearly at a true comprehension of the influenza problem than if we confine ourselves to purely pathological investigation of individual casualties.

It is to some results of the application of the historic and epidemiologic methods that I now propose to invite your brief attention.

What *is* influenza? The pathologists cannot tell us.

From time to time (indeed, almost every year) we meet with *cases* that are diagnosed, without difficulty, as influenza; and in some years we meet with so many cases of this fairly easily recognized form of illness, that we say "a good deal of influenza is about." These minor prevalences are apparently associated with climatic and seasonal variations, as well as with other factors.

But, at longer intervals (roughly so periodic as to occur once in a generation) there is what is called a "pandemic of influenza." All parts of the world, not simultaneously, but in rapid succession, manifest disorders of health roughly comparable to what is seen almost every year amongst persons and smaller communities, though generally more severe in form. These "pandemics of influenza," as they are called, are not mere numerical aggregations of cases of seasonal influenza. So, though in battles there are certainly hand-to-hand combats, and group fights, a battle is something more than a number of combats and fights occurring simultaneously. It is a series of coördinated happenings, not merely referable to the prowess of individual combatants, or the conditions in which they find themselves, but set in motion by such controlling forces as an elderly General ten miles away, himself emergized by still more distant springs of action, in London or Berlin.

A pandemic of influenza appears also to be a coördinated series of happenings, in which individuals and particular sets of circumstances play their part, no doubt, but still, one ultimately caused by forces or agencies widely affecting the whole set of conditions of life upon this planet.

Why is it that at such irregular but definite intervals as to be almost predictable (like the return of a comet) by mathematical calculation, there should be such a repetition of similar and widespread disorders of health if there be not, in the background, some general factor, telluric or cosmic, involving periodic variation in the conditions of all forms of life, human, animal, vegetable and even microbic?

We know that during pandemics of influenza not only are animals affected as were, in 1918, the reindeer in Labrador and the baboons in South Africa, but that even the characters of the microbic colonists of our bodies are altered, as indeed, on the bacteriological hypothesis of epidemics, they must be.

How else can we explain the "exaltation of virulence" of the microbes which is alleged in explanation of the increase in the number of cases of bacterial infection which, to the bacteriologist, constitutes an epidemic of influenza?

But there is another point. Although the waves of disordered health that we call influenza on the grand scale so resemble each other in their broad outlines that we ascribe them to the "same disease," yet they are not invariably precisely similar in the eyes of the clinical observer.

In great pandemics, "the disease," as we say, seems sometimes (as in the autumn of 1918) to be mainly pneumonic; on other occasions it is notably nervous, as in 1712, and in 1801; on others, as in the 1840's, it is gastrointestinal, or, as in the summer of 1918, it may be relatively trivial and rheumaticky, or bone-aching and agueish in type.

But, in each great pandemic, whatever its predominating character, there are local foci; and in each focus there are *cases* which are either respiratory, nervous, gastrointestinal, or agueish, and others which partake of all these characters in mild degree and that we call typical or simple.

Now experience, and history (which is only recorded experience), alike teach us that, though, as in 1918 and 1919, the chief and typical wave may be succeeded by a secondary, or even a tertiary wave, usually more special in character, nevertheless the great waves usually last, in each district affected, about six weeks from initial rise to final fall.

Moreover, for five hundred years at least, the first great wave of pandemic influenza during what I will call an influenza period (and there have been perhaps fifteen such), has been recorded as having taken the world by surprise, as if in a moment of forgetfulness: has been called a new disease somewhere, and has been given a new name by someone!

I well remember both the alarm and the facetiousness in 1889; they were reproduced in 1918, and will be again before 1950, while, I doubt not, a year or two later, at some Sanitary Congress in Siberia or Patagonia, someone will say much what I am now saying.

For what I say now is not new, and has been said every twenty or thirty years by someone since the days of the Sweating Sickness.

Historical investigation has clearly shown that what I have already hinted is a fact; that the great pandemics of influenza are not isolated phenomena, but are each a part of a series of organized disturbances of health spread over what I call an influenza period (a period during which there obtains what Hippocrates, Ballonius and Sydenham would have called a special "epidemic constitution") a period lasting, roughly, for the whole world, some five years or so. These influenza periods, though resembling each other as do the influenza epidemics and cases, yet differ as do *they* among themselves.

But the *central* waves of influenza during these special periods stand in organic relation to the other epidemiological events of the period, just as does the battle of the Somme in 1916 to the murders at Sarajevo in 1914, and to what is now happening in Syria.

Just as wars occur during periods of historic, political, and economic importance, so do pestilences, such as that of November, 1918, occur during epidemiological epochs. We find, moreover, that, just as wars and revolutions occur in relation to local wars, Continental disturbances, periods of aggrandizement, and the like, so do these great waves of pestilence occur *after* a period, during which there are scattered local outbreaks of intensive forms of disease, sometimes pneumonic or respiratory, sometimes nervous, sometimes gastrointestinal, and sometimes dengue-like or agueish.

Then, after the great waves, comes a period of retrogression, when we reap, as it were, the aftermath; when there are again here and there scattered peculiar and intensive outbreaks of disease. Finally interest flags, memory becomes faint, and influenza is forgotten save as a kind of severe cold that happens in the winter. Mention of it and its problems disappears from the text-books; it is remembered only by the curious.

It seems clear that, if we will only profit by experience, and keep the memory of these happenings fresh, we shall be able to forecast the coming storm when first appears on the horizon a cloud no bigger than a man's hand: that is to say, when these peculiar forms of epidemic disease that I have mentioned first make their appearance here and there.

The curious thing is that these premonitory and intensive outbreaks, or outbreaks of intense and peculiar forms of disease, should be so seldom recognized for what, with Dr. Hamer, I believe they are, namely, outbreaks which, though of a specialized type, are yet not to be distinguished by any specific character from what we call true influenza.

Indeed, *during* the recognized pandemics cases, of a nature indistinguishable from those seen in these peculiar outbreaks, are generally recognized as influenzal!

But, when occurring lumped together, as it were, or in bulk, they are almost always at first thought to mean a new disease, and, more curiously still, are very frequently ascribed to forms of food poisoning.

It was so in the Middle Ages, when the Germans ascribed such outbreaks to eating salt fish, sour apples and the like; it was so in the sixteenth, seventeenth and eighteenth centuries, when epidemics similar to our present sleeping sickness were confused with ergotism; it was so in the last century, when at Paris, in 1829, the herald of influenza of 1830 was a new disease called acrodynia, that baffled everyone, but was confidently put down to food; and again in Germany, when like happenings caused sausages to be blamed. The so-called botulism that, during the spring of 1918 preceded our Spanish influenza, is still fresh in our memories.

At the present time our American cousins are dealing with cases of like nature following this time in the wake of the passing influenza; and canned tomatoes and bottled olives are bearing the discredit.

Just before the great influenza of 1889-90 there was, at Middlesboro, an epidemic of pneumonia, in which the cases were identical with those of November, 1918. High authority implicated American bacon as not unconnected with the affair. About the same time a new disease appeared in the Mediterranean islands and coastlands: food again was suspected; and an epidemic of nervous disease in Sweden, in 1888-9 (which attracted attention owing to the masterly studies of Medin and others) was of the same nature as that which, in 1916, in New York, together with outbreaks of pneumonia throughout the states, should have warned us of what 1918 had in store for the world.

But the few who, like Dr. Hamer, insisted on the relation of these outbreaks to pandemic influenza, were scoffed at by those who confute what they call theories by ignoring facts.

The evidence for these particular statements and general conclusions cannot here be given, but Dr. Hamer has shown (and I have tried, by some detailed investigations, to test his conclusions) that, in considering influenza we should not confine our researches to the so-called typical cases and epidemics, but should study the recurrent periods or constitutions, during which influenza pandemics occur, and we can discern an ordered progression from sudden, scattered, anomalous and autonomous outbreaks of nervous, respiratory, gastrointestinal and other forms of disease to the widespread diffusion of simple influenza with cases and foci of special character, and thence to a regression, through a stage of scattered, trailing epidemics, to a normal state of seasonal prevalence and fluctuation, which lasts throughout a term of years until a new cycle commences. We are now entering upon the final phase and dealing with stragglers, not with scouts; but is not the lesson clear?

If these conclusions be valid we should be enabled, by a due prosecution of our studies, to attain some success in prognostication; and to be forewarned is to be forearmed.

But again, if our studies lead us to believe, as I think they will, that the ultimate causes of influenza periods are telluric or cosmic variations in conditions of life, we shall at least be spared the chasing of a will-o'-the-wisp. I have heard it said that belief in such ultimate causes is to be deprecated as tending to pessimism, and as inducing disbelief in the value of bacteriological methods and the like.

The only question really worth considering, is that of the *validity* of the conclusions arrived at; not their consequences. If, however, investigation on lines of historic, philosophic, and epidemiologic enquiry enables us justly to envisage the relations of the phenomena with which we have to deal, then surely the statesmen, the sanitarians, the physicians, and the bacteriologists will be able to concert such measures as will fortify the world populations against the coming of the catastrophes that we, in the first place, ascribe to the inscrutable *influences* of natural agencies; such measures as will enable these populations best to help themselves in the face of actual danger.

Although, until war and pestilence are abolished, we must initiate schemes of defence, our faith in these schemes need not hinder us from taking the longer and broader view, and *vice versa.*

And, in order to prevent or minimize pestilence, we must take long and broad views; we must study the precursors of the picturesque catastrophes that strike the popular imagination: we must teach the specialists and the communities how to recognize the coming of danger, and how to minimize its incidence by organized effort and by self-control.

If we do this, the experience of one generation will not be forfeited by the next, but will be handed down, a rich legacy of increasing capacity for racial adaptation, for the benefit of those who come after us.

BIBLIOGRAPHY.

Crookshank, F. G.: Proceedings, Royal Society of Medicine: (1) Section of History of Medicine, 1919, Vol. xii; (2) Section of Epidemiology, 1920, Vol. xiii.

Hamer, W. H.: Reports of the Medical Officer of the London County Council for 1917, 1918, 1919.

## Book Reviews.

*Studies in Neurology.* By HENRY HEAD, M.D., F.R.S. Vols. II, pp. 862. London: Henry Frowde, Hodder & Stoughton, Ltd, 1920.

The studies of Henry Head in conjunction with his colleagues, W. H. R. Rivers, Gordon Holmes, James Sherren, Theodore Thompson and George Riddoch, have appeared in the Oxford Medical Publication Series, which places them conveniently in the hands of students and investigators. The two volumes entitled "Studies in Neurology," comprise the collected papers of this group of English investigators on the subject of the sensory mechanism in its broadest aspects. The papers appeared, originally, without exception in "Brain," but have now been reëdited with a number of chapters explanatory of the text and of the subject in general. It is quite impossible in the scope of a brief review to enter into details of this work, familiar for many years to neurologists and students of the nervous system. The theories underlying the principles of deep, protopathic and epicritic sensibility have been generally accepted although they have not been free from certain definite criticism which is summarized in an appendix with critical comment.

In general the work must stand as monumental evidence of painstaking industry and accurate scientific inquiry, essentially from the physiological and experimental standpoint. Its bearing upon clinical work is indirect but ultimately of importance, for example, in the exact statements regarding return of function after nerve injuries and like practical matters. The introductory chapter discusses methods of testing and questions pertaining to the investigation of the sensory system, together with a brief statement of the nature and integration of sensation in its progress from the periphery to the brain. The second chapter on methods of examining sensation should be carefully read and pondered, in that it lays stress upon the absolute necessity of accuracy in investigation if results of scientific value are to be attained, a matter too often overlooked in the cursory reports from clinical sources. Following this chapter is a discussion of clinical application of the methods advocated.

The body of the two volumes is taken up with a reprint of the individual papers and comment thereon.

The peripheral nervous system fills the first volume. Perhaps the most notable paper in this series is the personal experiment conducted by Rivers and Head, in which a nerve in Dr. Head's arm was cut and the clinical manifestations during recovery carefully tabulated. The second volume concerns itself with the spinal cord and particularly with the grouping of afferent impulses. The various phenomena of disturbed innervation resulting from gross lesions of the cord, such as the automatic bladder and sweating, are discussed in detail in connection with the theory of the "mass reflex." Finally the sensory disturbances from cerebral lesions find more ample description than is usually accorded them. Various problems of sensation in its relation to the cerebral cortex with illustrative cases are detailed.

Whatever the criticisms may be of the theoretical assumptions upon which this entire work on sensation is based, it cannot be denied that Dr. Head and his colleagues have done more than any other living neurophysiologists to illuminate and clarify this most difficult and elusive branch of neurology. Whatever new knowledge the future may bring regarding the mechanism of sensation, it must take into account the painstaking work of these English students of the subject. However much their ideas may be modified, it is not probable that any group of men will have either the patience or the collective ability to repeat the long series of researches which have become identified with the names of Head and his colleagues. It is a satisfaction that the scattered papers have been collected and reprinted in these two substantial volumes.

*Public Health Laboratory Work.* By HENRY R. KENWOOD, C. M. G., M. B., F. R. S., Edin., D. P. H., F. C. S., Seventh edition: Paul B. Hoeber. New York. 1920.

The seventh edition of this book presents an outline of the work of the Chemical Branch of Public Health Laboratory Work. In this volume is excluded almost entirely the subject of bacteriology, which it has been found necessary to consider in a companion volume. Part I deals with the chemical, microscopical and physical examination of water for public health purposes; Part II describes methods of analyzing sewage or sewage effluents; Part III considers soil examination; Part IV air analysis; Part V, food examination with reference to adulteration and other forms of sophistication; Part VI the examination of disinfectants. The book contains excellent plates, diagrams and tables, and presents these aspects of the subject which have been proven by experience to be most useful to the public health workers and students.

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## THE FIRST STATE SECTION MEETING OF THE AMERICAN COLLEGE OF SURGEONS.

F. J. Cotton, *Chairman* C. F. Painter, *Secretary.*

The Massachusetts Section of the American College of Surgeons held its first annual session in Springfield, Mass., on Friday and Saturday, May 13 and 14, 1921. In spite of inclement weather, the attendance at all the meetings was gratifying. The registration book at headquarters in the Hotel Kimball, records the names of surgeons, not only from twenty cities and towns in Massachusetts, but also from every state in New England, and from Brooklyn, Baltimore, and Chicago.

A carefully arranged program had been most thoughtfully planned by the local Committee on Arrangements and was executed with admirable precision. When it is remembered that this was the initial effort, and that the committee was without any experience of other years to fall back on for ideas, it must be admitted that a standard has been set that future sessions will find difficult to equal. Springfield is not in any sense of the word, a medical educational center, with facilities that are commonly believed to make for advances in surgical knowledge and technique. The surgical staffs of its hospitals, however, demonstrated the end results of their surgical work in a remarkable showing of cured cases, many of whom came willingly from long distances, an exhibition comparable in completeness and brilliancy, if not perhaps in numbers, to any in the country. The list of cases creditably operated for this critical audience served simply to illustrate the high character of the surgery that is successfully accomplished here every week. All that was shown and done was instructive and well worth while, not only to local surgeons, but also to visitors who were visibly well impressed.

The plan for one public meeting was commendable. No small factor in its success was the happy selection of speakers who seemed intuitively to strike to a nicety that difficult middle ground that in technical matters holds the attention of a mixed audience because it is neither too far beyond the grasp of the untrained laity nor too familiar and elementary to the professional mind. Lay interest in the subjects discussed was apparent from the size of the audience in which Dr. Franklin Martin more or less truthfully asserted that he detected only four medical men.

The scientific session was characterized by papers of a very high order. The wish was afterwards freely voiced that the paper by Dr. Cannon might be delivered again at a public meeting for the benefit of the laity.

The success of the annual session, from every point of view, is unquestionable. It does not in the least detract from the praise due the local Committee on Arrangements to state that no small measure of the success was due to those who worked unnoticed. To the lesser lights on the hospital staffs; to the administrative departments of the hospitals; and especially to the nurses who, behind the scenes, gave silently and ungrudgingly the conscientious attention to countless unattractive, thankless, but essential details, that alone bring results, these inadequate words of grateful appreciation are extended.

At the Friday afternoon session on Hospital Standardization, Dr. Homer Gage of Worcester, gave a résumé of the efforts made at one of the Worcester Hospitals to apply some of the principles governing the conduct of a civil hospital as they are applied in military service. After having pointed out that patients, hospital staffs and the community have a right to insist that the hospitals shall live up to the highest standards in all respects which are established for a given time and shall keep abreast with the times, he cited the ways in which this goal can be achieved. He emphasized that there should be a resident physician who should furnish the compulsion for keeping up to standards which civil hospitals lack, but which military hospitals have in abundance. At weekly staff meetings the work of the week is reviewed. If cases are not doing well under the care of any members of the staff, it is brought out at this meeting, whether all the facilities for the study and care of that case which the resources of the institution provides were being utilized. and also if the equipment of the hospital fell short in providing anything that could possibly help in the solution of the problems presented by the case or cases.

At one of the four weekly meetings in each month, a further critical study of the results is presented, based upon the length of time that cases are being kept in the hospital over and above the time that a case of that kind usually requires. In acute abdominal cases, the question of the promptness of commencement of treatment and the reasons for delay may be the subject of inquiry. Agreement between the pre- and post-operative diagnoses are checked up; the questions of the number of consultations asked for and secured, or asked for and not obtained, or needed but not asked for, may also be the subject of inquiry. At this time, tabulations of cases and results, diagnoses and agreements between pre-and post-operative findings; frequency of complications, infections and condition at discharge; causes of death, etc., are all carefully reviewed, and report made to the Administrative Committee, and through them to the Trustees. All of this is, of course, absolutely dependent upon a well worked out and punctiliously observed system of record keeping and filing for permanent preservation.

SUBJECT: *American College of Surgeons.* Dr. Franklin Martin.

Dr. Martin said that the influence of the Army and Navy upon the problem of hospital standardization was tending to carry over into civil life the organization of hospitals as carried out by the military authorities. A good many hospital people seemed to be disturbed in the beginning of the college activities in this field, and accused them of meddling in hospital problems. It became apparent in the earliest efforts of the college to improve surgical standards that this would necessarily involve the standardization of hospitals. The first step in the procedure was to make a survey of all the hospitals in the country.

At a very considerable expense this preliminary survey has been completed. Five hundred and twenty-nine days of survey work have been put in by those selected by the college to make these observations.

A second investigation of the hospitals by the college has been about completed. This time the study was limited to hospitals of 100 beds or more, of which there are 697 in the United States. Four hundred and seven of these hospitals have already accepted the minimum standard which the American College of Surgeons has established. It has been the endeavor of the college to conduct these surveys in an inoffensive way and, as a result of their earlier experiences, the hospitals are now welcoming the extension of the survey, and are almost invariably enthusiastic to establish the standards which the college has set forth.

SUBJECT: *The Work of the Hospital Surveyor.* Dr. James L. Smith.

Dr. Smith stated that the purpose of the hospital surveyors was to offer constructive criticism, not destructive. In all cases the person making the survey had endeavored to get in touch, not only with the hospital superintendent and make his observations in company with him, but also with the staff and trustees. After an inspection of the building and equipment, both for the carrying on of the ordinary administration, housekeeping, and laundry and kitchen arrangements, the survey was carried on to the operating room, laboratories, x-ray department and record room.

It was always, also, a part of the duty of the surveyor to ascertain if the staff had regular meetings at which the discussion of the work of the hospital was carried on at periodic intervals, and to what extent they followed up the case histories of the patients admitted to the hospital, and kept permanent records of everything that was connected with the conduct of the cases as they passed through the institution.

Subject: *The Program of the American College of Surgeons as Applied to Catholic Hospitals.* Rev. C. B. Moulinier.

The speaker reviewed the history of the attempt on the part of the American College of Surgeons to standardize hospital organization, and showed how the Catholic Hospital Association, which was formed seven years ago, has endeavored to coöperate with the college in carrying out its program in the institutions under its supervision. The minimum standard has been applied by the Catholic hospital organization to practically all of the hospitals under its jurisdiction. He pointed out the reason that military hospitals could be properly standardized was that there was a compelling force behind the hospital organization, a force that saw to it that the measures that they believed to be desirable and necessary were punctiliously carried out. If they were not, the Surgeon General of the Navy, or Army, as the case might be, was immediately acquainted with the offender and the hospital in question was brought up with a round turn.

The purpose of the College in bringing this subject so widely before the public, not only the public that is especially concerned in hospital management, but also the lay public at large, is to supply a moral backing to the situation just as the Surgeon General's purpose was to supply moral backing to the hospitals under its supervision.

He pointed out the fact that it was a moral obligation that staff, nurses, and everyone that is connected with the hospitals has in keeping accurate records of the patients that pass through.

The public are entitled, in the treatment of their sick, to the assurance that everything is supplied by the hospital that modern science and experience has shown to be worth while. A failure to come up to this standard is not only reprehensible, but is a moral failure.

Subject: *The Hospital Program of the American College of Surgeons and the Minimum Standard.* Judge Harold M. Stephens.

Judge Stephens stated that the primary object of the American College of Surgeons was to make better surgeons. Its first move in attempting to do this was the study of the 3000 hospitals which there are in the United States and Canada. This study was commenced in 1915 and included the study of the technique of doing the work of the hospital in all its phases, the personnel of the staff and the equipment which was provided by the trustees.

The defects that were most conspicuous were lack of staff organization, poor quality of staff personnel, lack of proper and scientific record making, defective equipment of all sorts, notably in respect to laboratory findings.

The sum total of the inefficiency of a hospital based upon defects of the character which the survey brought out, resulted in an impairment of the functioning power of the hospital. Improvement in these respects would therefore result in an increase in the functioning capacity of the institution that was willing to have itself improved.

Subject: *Experience with the Standardization Program of the American College of Surgeons from the Hospital Superintendent's Standpoint.* Wayman C. Lyon.

Since the Springfield Hospital, at which the speaker was the Superintendent, had put into operation the minimum standardization of the American College of Surgeons, it had stressed the importance of the case record system, the betterment of laboratory facilities and the organization of their staff. He emphasized the fact that in all attempts by organization and otherwise, to improve the hospital's efficiency, the ultimate object in view was the provision of better service for the patient. The taking of good hospital records and recording in available form, and the insurance of a permanency to the record and its care, is of the utmost value to the institution as well as to the patient and his friends.

It is of immense value, oftentimes, in the matter of the demands made upon the hospital records for court purposes. When the records are uniformly well taken, the hospital is credited with superior skill by those who are called upon to make use of such records in the conduct of court proceedings. He felt that the staff organization was, perhaps, of the most importance of the various methods which they had pursued in an endeavor to better the functioning of the hospital. He laid special stress upon the value of the monthly staff meetings, at which there were presented casualty reports which included, not merely the deaths which occurred in the hospital, but infections and complications of all sorts that might have been connected with the care of patients.

A discussion of these papers was opened by Dr. Brace Paddock of Pittsfield, who contributed a short paper relating to the obstetric situation in Massachusetts and the importance that the standardization of hospitals might have upon the management of this situation. He stated that in the state, between 600 and 700 women die yearly as a result of confinement, that is six or seven in the thousand. Thirty-nine per cent. of these deaths are thought to be avoidable. In a survey which has been hastily carried out with reference to the deaths occurring in public institutions among puerperal patients, twenty such hospitals have made return, but in general, the report of obstetric cases in public hospitals is very unsatisfactory, and very little can be learned in regard to the cause of the unfortunate results. Thirty-three per cent. of the deaths were the result of eclampsia; eleven per cent., sepsis; eight per cent., following Caesarean section.

Dr. P. E. Truesdale continued the discussion by saying that the hospital superintendents are the principal "beneficiaries under the act," so far as their relations to the matter of hospital standardization are concerned, and that they will welcome the surgeons delegated by the American College of Surgeons in the carrying out of the surveys which the College desires to make. He stated that it was already apparent in a number of institutions with which he was familiar that the effects of the survey had been beneficient. He made a plea for the inclusion in the records that the hospital is entitled to make for the autopsy, and hoped that some method would be worked out by which the results of clinical study and observation might find their confirmation, or the opposite, in the autopsy record. The weakness of this link in the chain was a serious one, he said.

Dr. E. A. Codman of Boston advocated that the great teaching institutions, as well as the hospitals, should stress the subject of hospital standardization wherever they had opportunity before the students.

Dr. Slattery, Superintendent of St. Elizabeth's Hospital, Brighton, had found the minimum standard established by the College to be a very effective club to keep the staff in line, for without properly kept records, they could not have the benefit of house officers, as none but an A class hospital would attract medical students to house officer positions.

Dr. Samuel Woodward of Worcester, entered into the discussion as a hospital trustee, urging a closer touch between the staff and the trustees. He stated that it was his opinion that boards of trustees should, where possible, have a surgeon as a member. In this way, a more sympathetic coöperation might be secured between the staff and the trustees.

The general subject was further discussed by Doctors Mehan of Lowell, Myrick of the New England Hospital for Women and Children, Dr. Shadman of Forest Hills, Dr. Carmichael of Springfield, and Dr. Prior of Malden.

Program of clinical exercises:

SPRINGFIELD HOSPITAL, FRIDAY, MAY 13, 1921.

ROOM 1
ACCIDENT

10.30-10.45, Dr. Jones
Transfusion and Path. Spec.
10.45-11.15, Dr. A. Rice
Osteomyelitis
11.30-12, Dr. Sweet
Multiple Fractures

ROOM 2
RECOVERY

10.30-11, Dr. L. Chapin
Heart Cases
11-12.30, Dr. Birnie
Caesarean Section and Intussusception Large Bowel

ROOM 3
N. AND TH.

10.30-11, Dr. Goodell
Mastoid Cases
11-11.30, Dr. Dalton
Eye Cases
12-12.30, Dr. Sullivan, Dr. Kilburn: G. U. Cases, Swift-Ellis

ROOM 4
S. OP. R.

10.30-11.30, Dr. Sweet, Dr. Bates, Dr. Van Allen
Malignant Diseases of the Bowel
11.30-12, Dr. Seelye
Non-malignant Diseases of Large Bowel
12-1, Dr. Ober.
Resection Operation on Stomach

ROOM 5
L. OP. R.

10.30-11.30, Dr. Carleton
Congenital Hip. Gas Bacillus Infection. Gunshot Wound
11.30-12.30, Dr. Wheat
Orth. Cases

ROOM 6
WARD A

10.30-11, Dr. Eastman
After-treatment and Feeding of Infants Following Operation for Pyloric Stenosis. Care of Premature Infants
11-12, Dr. Benner
Renal Calculus

X-RAY ROOM

Dr. Van Allen
X-ray Display. Radium Cases. Demonstration of Buckey Diaphragm.

ROOM 7
WARD B

Dr. Alcorn
Meningocele
Dr. Ober
Aneurysf, Aorta. Mesenteric Cyst. Oesophageal Stricture.
Dr. Eastman
Pneumothorax
Dr. Sweet
Unilateral Polycystic Kidney. Decortication of Lung for Empyema. Partial Nephrectomy
Dr. Hopkins
Submaxillary Glands. Calculus
Dr Alcorn
Cyst of Urachus. Resection of Stomach

### Springfield Hospital, Saturday, May 14, 1921.

#### Large Room 1.

9.30 A.M., Dr. Alcorn, Appendectomy.
10.00 A.M., Dr. Alcorn, Abd. Hysterectomy (Fibroid).
10.45 A.M., Dr. Alcorn, Ex. Laparotomy (Carcinoma—Secondary).
11.30 A.M., Dr. Alcorn, Vaginal Hysterectomy (Prolapse).
11.45 A.M., Dr. Alcorn, Appendectomy.

#### Small Room 2.

8.30 A.M., Dr. Benner, Herniotomy.
9.00 A.M., Dr. Benner, Gall-bladder.
9.30 A.M., Dr. Seelye, Double Herniotomy.
10.45 A.M., Dr. Carleton, Old Potts Fracture.
11.30 A.M., Dr. Carleton, Osteomyelitis.

#### Nose and Throat Room.

10.00 A.M., Dr. Dalton, Mastoid.
10.30 A.M., Dr. Dalton, Needling Cataract.
12.00 M., Dr. Sullivan, Swift-Ellis (2 cases).

#### Chapin Operating Room.

8.00 A.M., Dr. Sweet, Appendectomy.
8.20 A.M., Dr. Sweet, Amputation Breast.
9.00 A.M., Dr. Sweet, Appendix.
9.20 A.M., Dr. Sweet, Ventral Hernia.
10.20 A.M., Dr. Sweet, Double Inguinal Hernia.
11.00 A.M., Dr. Sweet, Amputation Breast.
11.45 A.M., Dr. Sweet, Barton-Hirst.
8.15 A.M., Dr. Goodell, Adenoids and Tonsils.

### Mercy Hospital, Friday, May 13, 1921.

#### Eye, Ear, Nose and Throat.

10.00 A.M., Clinic End Results (4 cases), Large Ward, First Floor, H. F. Byrnes, M.D.
10.00 A.M., Operation: Submucous Resection (adult), J. O. Beauchamp, M.D.
10.00 A.M., Operation: Submucous Resection (child), J. H. Gallagher, M.D.
11.00 A.M., Operation: Tonsillectomy (child), F. J. McKechnie, M.D.
11.30 A.M., Operation: Tonsillectomy (adult), H. F. Byrnes, M.D.

#### General Surgery.

9.30 A.M., Rectal Fistula (female), Curettage Head of Femur—Tuberculosis—(male), Fistula in Ano (male), C. F. Lynch, M.D.
11.30 A.M., Hysterectomy—Fibroid—(female), Gastroenterostomy—Ulcer Pylorus—(male), D. and C.—Pelvic Peritonitis, Retroversion of Uterus, E. J. Mahoney, M.D.

### Mercy Hospital, Saturday, May 14, 1921.

#### Eye, Ear, Nose and Throat.

10.00 A.M., Operation: Tonsillectomies (children), J. H. Gallagher, M.D.
10.00 A.M., Operation: Tonsillectomies (children), F. J. McKechnie, M.D.
10.30 A.M., Operation: Tonsillectomy (adult), H. J. Byrnes, M.D.

#### General Surgery.

9.30 A.M., Herniotomy, Umbilical, (male); Herniotomy, Femoral, (female); Herniotomy, inguinal, (male); Nephropexy (female); Hysterectomy, Appendectomy, Fixation of Uterus, Glands of Neck (female); Intestinal Obstruction, Carcinoma (female), E. J. Mahoney, M.D.
10.00 A.M., Duodenal Ulcer, Pancreatitis Hemorrhagica, C. F. Lynch, M.D.
Perth's Disease, Lymphatic Leukemia, Multiple Fractures, J. P. Byrnes, M.D.
Skin Graft, R. A. Rochford, M.D.
Muscular Spiral and Ulnar Paralysis, G. B. Corcoran, M.D.

### Wesson Memorial Hospital, Friday, May 13, 1921.

#### Demonstrations.

10.30 A.M.-12 M., X-ray Work, Gorman.
10.30 A.M.-12 M., Drainage of Gall-bladder by Einhorn Duodenal Tube, Cline.
10.30 A.M.-12 M., Imperforate Nostrils, Courow.
10.30 A.M.-12 M., Fracture Femur (2 cases), Hovey.
10.30 A.M.-12 M., Osteomyelitis (2 cases), Carmichael.
10.30 A.M.-12 M., Ventral Hernia (post operation), Smith.
10.30 A.M., Operation: Laparotomy, Smith.

### Wesson Memorial Hospital, Saturday, May 14, 1921.

#### Operations.

9.30 A.M., Gastroenterostomy, Carmichael.
10.30 A.M., Nephropexy, Carmichael.
11.00 A.M., Umbilical Hernia, Hovey.
11.30 A.M., Salpingo oöphorectomy, Smith.
12.00 M., Tonsils and Adenoids, Chapman.
12.30 P.M., Uterine Suspension, Hovey.

## NOTES FROM DISTRICT SOCIETIES.

The Hampshire District Medical Society held its annual meeting at the Forbes Library, Northampton, on May 11, at 11.30 A.M. Dr. Sidney A. Clark, Northampton, gave the presidential address, "Medical Practice 30 Years Ago." Dr. H. T. Weston of Hartford, Conn., addressed the members on liability insurance. The following officers were elected: President, Dr. A. J. Bonneville, Hatfield; Vice-President, Dr. C. E. Perry, Haydenville; Secretary-Treasurer, Dr. E. E. Thomas, Northampton; Librarian, Dr. L. O. Whitman, Northampton; Commissioner of Trials, Dr. S. A. Clark; Censors: Dr. J. E. Hayes, Supervisor, Northampton; Drs. F. E .Dow and W. J. Collins, Northampton; H. G. Rockwell, Amherst, and W. P. Stutson, Cummington; Councillors, Drs. J. E. Hayes, H. B. Perry, D. M. Ryan, Ware, and O. W. Cobb, Easthampton.

The annual meeting of the Essex South District Medical Society was held at Wardhurst, Lynnfield, on May 11, at 6.30 P.M. The annual reports of the Secretary, Treasurer and Auditor were accepted for the files. The following officers were elected for the ensuing year:

President, Dr. P. P. Johnson, Beverly; Vice-President, Dr. J. B. MacDonald, Hathorne; Secretary, Dr. G. E. Tucker, Salem; Treasurer, Dr. G. Z. Goodell, Salem; Librarian, Dr. C. M. Cobb, Lynn; Commissioner of Trials, Dr. J. E. Simpson, Salem; Council, Dr. W. T. Hopkins of Lynn, Dr. E. S. O'Keefe of Lynn, Dr. J. F. Donaldson of Salem, Dr. W. G. Phippen of

Salem, Dr. A. N. Sargent of Salem, Dr. H. K. Foster of Peabody, Dr. J. F. Jordan of Peabody, Dr. R. E. Stone of Beverly, Dr. G. M. Kline of Beverly, Dr. S. P. F. Cook of Gloucester, Dr. S. W. Mooring of Gloucester; Nominating Councillor, Dr. W. G. Phippen, Salem; Alternate Nominating Councillor, Dr. R. E. Stone, Beverly; Censors, Dr. J. F. Donaldson (Supervisor) of Salem, Dr. J. A. Shatswell of Beverly, Dr. F. W. Baldwin of Danvers, Dr. J. W. Trask of Lynn, Dr. A. T. Hawes of Lynn; Executive Committee, Dr. C. L. Curtis of Salem, Dr. P. P. Moore of Gloucester, Dr. W. L. Fraser of Lynn.

A resolution was adopted declaring it to be the sense of this meeting that the change in rates for service to physicians proposed by the New England Telephone Company is inequitable. It was further voted to send a committee to the hearing upon this subject granted by the Commission on Public Utilities, that this Society might join the Somerville Medical Society in protest against the proposed change.

The guest of the evening was Dr. William H. Smith of Boston, whose address was upon "Angina Pectoris." A general discussion followed, and the meeting terminated with a rising vote of thanks to the speaker.

The Franklin District Medical Society held its annual meeting May 10th, following dinner at the Mansion House, Greenfield, at 6.30 p.m. Dr. H. N. Howe read a very instructive paper on "Broncho Pneumonia in Young Children." This was pronounced by all who were permitted to hear it, of such comprehensive breadth and insight that it would be well worth being printed in the Boston Medical and Surgical Journal. Dr. A. L. Johnson gave a brief and helpful abstract from recent literature on "Encephalitis Lethargica." The question of entering into action with other societies in protesting the proposed "business rates" for the physicians by the N. E. Telephone Co., was discussed, but no action taken. The motion by Dr. Twitchell to endorse the proposition of a joint meeting with the Berkshire, Hampshire and Hampden societies was adopted. Dr. Goldsbury reported upon the formation of a committee to promote "Rural Health and Medical Service," and of its object to advance the interests of physicians away from the big centres through the establishment of hospital clinics within their reach. He has visited about half the towns in the county, and interviewed some 25 physicians regarding this and the plans of social service agencies in putting in county and district nurses. The following officers were elected: President, J. A. Mather; Vice-President, H. A. Suiter; Secretary and Treasurer, H. N. Kemp: Censors, H. G. Stetson, H. N. Howe, Charles Moline, R. H. Philbrick and A. L. Newton; Commissioner of Trials, P. F. Leary; Nominating Councillors, H. G. Stetson and C. L. Upton; Auditors, C. F. Canedy and A. L. Johnson. Reporter for the Medical Journal, P. W. Goldsbury.

## MEDICAL NOTES.

The Journal will not be sent to those members of the Massachusetts Medical Society whose annual dues remain unpaid after June 1, 1921.

Yeast Now in Pill Form.—The value of yeast as a source of vitamines has become well established. Yeast has been used for many years with good results in the treatment of boils, acne, scurvy, infantile eczema and intestinal troubles; also for the correction of chronic constipation. The chief drawback to the use of the yeast itself for medicinal purposes is that many find it unpalatable, often indeed nauseating. By the introduction of Yeastone (the active principles and vitamines of yeast in pill form), these difficulties are removed. Physicians can obtain Yeastone pills from their druggists by writing "Merck" on prescriptions and making the request to order if not in stock.

The Journal is informed that the scope of work done in the Charles B. Towns Hospital is extended to deal with postoperative and medical convalescent patients suffering with toxemic disorders due to faulty metabolism. Physicians sending patients may coöperate in the treatment given.

Women of the Public Health Service.—In proportion to its size, the personnel of the U. S. Public Health Service probably includes more highly trained and specialized women than any other branch of the Federal Government.

Highest on the list stand two officers holding commissioned rank in the reserve — Surgeons Lydia Allen DeVilbiss and Josephine Baker. Next in rank come a number of scientific and professional women, all, or most of whom are physicians, though some are classified by other titles. Among these are Acting Assistant Surgeons Blanche Sterling and Edith B. Lowry, Viola Russel, pediatrist, and Elizabeth B. Reid, all of the Child Hygiene Section; Ida A. Bengtson, Sanitary Biologist; and Mrs. S. C. Brooks, Assistant Biologist, all of the Hygienic Laboratory; Gertrude Seymour, President of the American Women in Public Health, and Drs. Daisy Robinson and Edith Rabe, regional consultants, all of the venereal diseases divisions.

Several large groups of highly trained women have been organized in the Public Health Service. Among these are the reconstruction aides, most of whom have had college training or its equivalent, and all of whom are of unusual ability and character. These are stationed at various hospitals of the Service throughout the country. Their task is to help maimed soldiers to regain control of injured muscles and nerves, or of dormant or deranged mental faculties by appropriate physical exercises (physio-therapy) or by curative and diversional occupations (occupational therapy). The aides, who are headed by Miss Marian Morriss, number about 400, to whom others will be added as qualified applicants can be found.

Vieing with the reconstruction aides are the dietitians, whose section was organized about a year ago to take over from the pharmacists the victualing and food administration of the scores of military hospitals now handled by the Public Health Service. All the members of the section, which is headed by Mrs. H. B. Corsette, are graduates of schools of household economics and are thoroughly trained and experienced in all matters relating to dieting. When fully recruited, the personnel will be about 200.

The nurses' corps, headed by Miss Lucy Minnegerode, consists of nurses who have been highly trained in every-day hospital work and a large proportion of whom are specialists in particular lines, such as mental and nervous diseases and tuberculosis. The corps today numbers 1,400 and needs 300 more. All applicants must, however, be graduates of recognized training schools, and must be registered either in the state in which they live or in that in which they were graduated.

Another body of nurses, 165 in number, who work in clinics and miscellaneous health activities, under the supervision of Miss Ann Doyle, specializes in venereal disease treatment.

## BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending May 14, 1921, the number of deaths reported was 185 against 209 last year, with a rate of 12.74 against 13.48 last year. There were 39 deaths under one year of age against 24 last year.

The number of cases of principal reportable diseases were: Diphtheria, 57; scarlet fever, 45; measles, 107; whooping cough, 18; typhoid fever, 2; tuberculosis, 30.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 6; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 7; measles, 1; whooping cough, 1; typhoid fever, 1; tuberculosis, 18.

Included in the above were the following cases of non-residents: Diphtheria, 2; tuberculosis, 3.

The Regular Meeting of the New England Association for Physical Therapeutics was held on Tuesday, May 24, at 8 o'clock, at the Hotel Victoria, Boston. The subject of the evening was an address by William L. Clark, M.D., of Philadelphia, on "Electrothermic Methods and Radium in Surgical Conditions." Dr. Clark has done a good deal of original work in this line. A Table d'hôte dinner was served in the Grill Room, Hotel Victoria, at 6.30 p.m.

"Suprarenalin" Again Available. — For some years the epinephrine preparation most widely used in the United States has been the "adrenalin" brand, although synthetic "suprarenin," originally of German origin, has been listed. It is now announced (Report of the Council on Pharmacy and Chemistry, *Jour. Amer. Med. Assoc.*, 76, May 14, 1921, p. 1353) that the "suprarenalin" brand (prepared by Armour and Company of Chicago) is again available; this differs from the more commonly employed brand of epinephrin in that the solution is that of the sulphite instead of the hydrochloride. It is marketed in the form of a 1 to 1,000 solution.

Public Health Service.—Since the signing of the armistice, state boards of health, assisted by the U. S. Public Health Service, have established in dispensaries and hospitals, more than 400 clinics for the free treatment of persons afflicted with venereal diseases (gonorrhea and syphilis).

To aid in the work, the Federal Government appropriated more than two and a half million dollars to be allotted to the States on a fifty-fifty basis; and now every state in the Union has accepted the offer.

At the clinics, diseased persons receive, free of charge, or at small expense, the best modern treatment that money and science can provide. Arsphenamine (606) and other expensive drugs are provided for patients who are unable to pay for them. Without this help, many infected persons would never be treated; with it, thousands have been cured and many thousands of walking sources of infection have been removed. In the last two years, more than 200,000 persons were treated in these clinics; and in 1920 alone, a million and a half treatments were given.

The last Congress, however, failed to continue this coöperative appropriation; and, unless the present Congress comes speedily to the rescue, Federal aid to the states must cease soon after June 30.

Public Health Service and Nervous Mental Diseases.—Drs. J. K. Fuller and T. J. Heldt, both of the U. S. Public Health Service, left Washington on April 2 to visit the medical colleges of the United States to recruit personnel, especially internes, for the care of nervous mental patients in service hospitals. Dr. Fuller, who has been directing the clinical work at St. Elizabeth's Hospital in Washington, is visiting southern and western colleges; and Dr. Heldt, clinical director of the Service Hospital at Wankesha, Mich., is visiting those in the North and Middle West.

Dr. G. H. Benton, of the staff of the U. S. Public Health Service's Neuropsychiatric Hospital at Waukesha, Wis., will read a paper on "War Neuroses," before the American Medical Association meeting at Boston, Mass. Like other officers serving in such hospitals, Dr. Benton has had wonderful opportunities to study the varied types of neuroses, ranging from anxiety and tremulous states to aphroia and functional defects, many of these complicated by endocrine imbalance and focal infection.

Hearing on Telephone Rates.—An all-day session of the Public Utilities Commission was held on May 12 for the purpose of giving an opportunity to physicians of Greater Boston to register their protests against the proposed action of the Telephone Company. The Company, as has been stated in the Journal, proposes to charge business rates for telephones installed in the residences of physicians. Over 300 doctors attended the hearing, together with many senators and representatives from the legislature. The case of the physicians was presented by Attorney William A. Morse, who had been retained by the Somerville Medical Society. Representative John M. Woods of Somerville, Dean of the Massachusetts House of Representatives, was called first after the opening argument by Attorney Morse. Mr. Woods spoke, as a citizen, of the value and necessity of physicians to the community. Dr. Charles E. Abbot of Andover, and Dr. Ezra W. Clark of Brockton, both members of the Massachusetts Legislature, spoke against the measure. Drs. M. W. White, Chas. T. Mongan and H. E. Buffum outlined the position of the Somerville Medical Society, which resulted in the request for the hearing. Dr. Fred B. Lund, president of the Suffolk Society of 1000 members; Dr. Walter Lane representing 600 members of the Norfolk Society; Dr. Harvey Van Allen of Springfield, representing 600 physicians in his district, and Senator Tarbell, professionally representing 500 physicians of his constituency, all spoke in opposition to the measure. Numerous individual physicians spoke. The contention of the Telephone Company was that the word, "Phys," inserted in the telephone directory after the doctor's name, constituted an advertisement.

## The Massachusetts Medical Society

### PROGRAM OF THE ONE HUNDRED AND FORTIETH ANNIVERSARY.

Owing to the meeting of the American Medical Association, in Boston, the week following the meeting of the Massachusetts Medical Society, there will be no Section meetings this year. The exercises on Tuesday, May 31, will be held at the Boston Medical Library, 8 The Fenway; those on Wednesday, June 1, at the Copley-Plaza Hotel.

A Bureau of Information will be maintained in the lobby of the Copley-Plaza Hotel, Wednesday morning. **Fellows are requested to register and procure their dinner tickets as early as possible on Wednesday.** Tables cannot be reserved, but those who procure their tickets early will be able to sit together, if they wish. The Dinner will be held at 1 P. M The price of the tickets will be two dollars

Automobiles may be parked, under supervision, at the Medical Library, Tuesday, and at the Copley-Plaza, Wednesday.

## TUESDAY AFTERNOON, MAY 31, 1921.

### Boston Medical Library.

### ANNUAL MEETING OF THE SUPERVISORS

John Ware Hall, 4.30 O'Clock.

### ANNUAL MEETING OF THE COUNCIL

John Ware Hall, 5.00 O'Clock.

The "Cotting Lunch" will be served immediately after the meeting, in the Supper Room.

## TUESDAY EVENING, MAY 31, 1921.

### THE SHATTUCK LECTURE.

John Ware Hall, 8.00 O'Clock.

By Dr. Haven Emerson of New York.

Subject: **"The Prevention of Heart Disease, A New Practical Problem."**

After the lecture light refreshments will be served in the Supper Room.

## WEDNESDAY MORNING, JUNE 1, 1921.

### ONE HUNDRED AND FORTIETH ANNIVERSARY

Foyer, Copley-Plaza Hotel, 9.30 O'Clock.

### Business of the Annual Meeting.

The following amendments to the By-Laws, as approved by the Council, February 2, 1920, will be acted on:

Chapter IV, Section 3, of the By-Laws be so amended that the last sentence of paragraph one shall read: "Councilors only, shall be eligible to the offices above named," viz., president, vice-president, secretary, treasurer and librarian, thus conforming the By-Laws to the Statutes, 1803, Chapter 85, Section 3. Digest, Article V, paragraph 3, which provides that the Councilors shall "appoint, from among themselves, a president, and such other officers of the said corporation as are to be so appointed."

Chapter I, Section 2 of the By-Laws: After the words "fiscal year," line two, insert in parenthesis marks "except as hereafter provided in Section 6 of this chapter"; also Chapter I, Section 6. The last sentence of paragraph one shall read: "The assessment paid by fellows who are admitted to the society following the November examinations, shall be that fixed for the next succeeding fiscal year, and shall cover the dues both for the current year and for the next fiscal year."

The following papers will be presented:

1. **"Maternity Aid and Infant Welfare."**
   Dr. Walter P. Bowers, Clinton.
2. **"Legislative Aspects of Vaccination."**
   Dr. Samuel B. Woodward, Worcester.
3. **"Physical Education of Children and Physical Training in the Public Schools."**
   Dr. Joel E. Goldthwait, Boston.
4. **"Premedical Education."**
   Dr. David L. Edsall, Cambridge.

**The Annual Discourse** will be given by Dr. F. W. Anthony of Haverhill, at 12 noon.

Subject: **"Some of the Mutual Relations Between the Physician and the Commonwealth."**

**The Annual Dinner** will be served in the Ball Room immediately after the Annual Discourse.

### MEETINGS OF THE COUNCIL

The Annual Meeting, Tuesday, May 31, 1921, at the Boston Medical Library. Other Stated Meetings in John Ware Hall, Boston Medical Library, on the first Wednesdays of October and February.

### CENSORS' MEETINGS.

The Censors for the several districts will meet for the examination of applicants for fellowship on the first Thursdays of May and November.

The Censors for the Suffolk District will examine applicants residing in that district and also applicants who are non-residents of Massachusetts.

Applicants for fellowship should apply to the Secretary of the District Society of the district in which they reside (have a legal residence) at least one week before the date of a given examination, taking with them their degrees in medicine.

### OFFICERS OF THE SOCIETY.

| | |
|---|---|
| Alfred Worcester, . . . . . . . .<br>751 Main Street, Waltham, Boston 54. | President |
| Frederick Ellis Jones, . . . .<br>1150 Hancock Street, Quincy, Boston 69. | Vice-President |
| Walter L. Burrage, . . . . . .<br>42 Eliot Street, Jamaica Plain, Boston 30. | Secretary |
| Arthur K. Stone, . . . . . . .<br>Auburn Street, Framingham Center. | Treasurer |
| Edwin H. Brigham, Brookline, . .<br>8 The Fenway, Boston 17. | Librarian |

### STANDING COMMITTEES.

#### OF ARRANGEMENTS.

C. H. Lawrence J. B. Swift
Donald Macomber K. G. Percy
A. W. Reggio F. J. Callanan

#### ON PUBLICATIONS AND SCIENTIFIC PAPERS.

E. W. Taylor R. B. Osgood F. T. Lord
R. M. Green A. C. Getchell

#### ON MEMBERSHIP AND FINANCE.

S. B. Woodward A. Coolidge, Jr. Samuel Crowell
Gilman Osgood Homer Gage

#### ON ETHICS AND DISCIPLINE

J. W. Bartol Henry Jackson T. J. Robinson
David Cheever F. W. Anthony

### ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS.

C. Frothingham C. F. Painter J. F. Burnham
A. G. Howard R. L. De Normandie

### ON STATE AND NATIONAL LEGISLATION.

Alfred Worcester F. G. Wheatley E. H. Stevens
F. E. Jones J. S. Stone

### ON PUBLIC HEALTH.

E. H. Bigelow Annie L. Hamilton E. F. Cody
Victor Safford R. I. Lee

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## DELEGATES AND ALTERNATES TO THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION.

| DELEGATES | ALTERNATES |
|---|---|
| F. B. Lund | W. H. Robey, Jr. |
| E. F. Cody | F. W. Anthony |
| H. G. Stetson | L. A. Jones |
| C. E. Mongan | Gilman Osgood |
| J. F. Burnham | A. R. Crandell |

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C. H. Lawrence, { Chairman of Committee of Arrangements

520 Commonwealth Avenue, Boston 17.

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## THE JOURNAL.

The *Boston Medical and Surgical Journal*, the official organ of the Society, will be sent to Fellows who have paid their assessments, and to such Honorary and Retired Fellows as may apply to the Librarian for the *Journal*. All inquiries in regard to the *Journal*, and prompt notice of change of address, to prevent misdirection, should be addressed to the Librarian.

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## TREASURER'S NOTICE.

Assessments should be paid to District Treasurers before the meeting or, in the case of non-residents, to the Treasurer.

Assessments were due January 1st, but for the convenience of members who have been unable to pay, assessments will be received for the Treasurer at the meeting.

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## NOTICES.

Boston City Hospital.—Staff Clinical Meeting, Cheever Surgical Amphitheatre, Friday, May 27, 1921, at 8.15 o'clock p.m.

### TOPICS.

1. Some Aspects of the Functional Pathology of Lobar Pneumonia. Speakers: Thomas E. Buckman, M.D., 15 minutes; F. Dennette Adams, M.D., 10 minutes; Harold T. Edwards, M.D., 10 minutes. Discussed by James Means, M.D.
2. Studies in Cutaneous Reactions in Pneumonia. Speaker: George H. Bigelow, M.D., 15 minutes.
3. Studies in Immunity in Pneumonia. Speakers: W. L. Moss, M.D., and L. H. Ferguson, M.D., 15 minutes.
4. Studies in Pneumonia in Children. Speaker: Arthur B. Lyon, M.D., 10 minutes.

Physicians and medical students invited. Open discussion. Dr. Edwin A. Locke will preside.

Bigelow Medal Address.—Dr. William J. Mayo will give an address entitled "In the Time of Henry Jacob Bigelow," on Monday, June 6, 1921, at half past eight o'clock, Jordan Hall, Huntington Avenue and Gainsboro Street, Boston. On this occasion will be made the first award of the Henry Jacob Bigelow medal. Tickets of admission may be secured by addressing Dr. Walter C. Howe, Secretary Boston Surgical Society, 303 Beacon St., Boston, Mass.

The Annual Meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 The Fenway, May 31, 1921, at 5 o'clock p.m.

### Business.

1. Reports of Standing Committees.
2. Petitions for restoration to the privileges of fellowship.
3. Report of Committee of Nine, on the Journal.
4. Reports of Treasurer and Librarian.
5. Election of officers and orator for 1921-1922.
6. Appointment of Standing Committees for 1921-1922.
7. Elect three members of Committee on Nine for three years.
8. Incidental Business:
   - (*a*) A memorial to Dr. Samuel Fuller (1580-1633).
   - (*b*) Preamble and resolution of National Anaesthesia Research Society.
   - (*c*) A delegate to Second International Eugenics Congress in New York City, September 22-28, 1921.

Walter L. Burrage, *Secretary*.

Boston, May 24, 1921.

Councilors are reminded to sign the attendance book before the meeting.

Harvard Medical School.—Dr. Carlos Chagas, Director of the Institute Oswaldo Cruz, Rio de Janeiro, touring the United States under the direction of The Rockefeller Foundation, will give a series of three lectures with lantern slides at the Harvard Medical School, on the following dates: Thursday, May 26, 5 p.m., Amphitheatre E, "American Trypanosomiasis: Studies of the Parasite and of the Transmitting Insect"; Friday, May 27, 12.30 p.m., Amphitheatre A, "Cardiac Forms of American Trypanosomiasis"; Friday, May 27, 5 p.m., Amphitheatre E., "Pathogenic Processes of American Trypanosomiasis."

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## RECENT DEATHS.

Dr. William Allen Brooks died May 19, 1921. Extended obituary notice will appear later.

Dr. Charles F. McCarthy died May 19, 1921.

Dr. Aurelius E. Sherwin died April 8, 1921, at 612 Columbus Avenue, Boston, aged 84. He was graduated from the University of Vermont Medical School in 1878. He was a member of the Vermont and White River Junction Medical Societies. He practised in Boston thirty years. Early in life he was Superintendent of Schools in Barton, Vermont.

Dr. Bradford Allen, a Fellow of the Massachusetts Medical Society, died by suicide at his home in Nashua, N. H., May 2, 1921, at the age of 64.

He was born in East Bridgewater, Mass., January 23, 1857, received his education in the schools of that town and at Amherst College, where he took the degree of S.B. in 1878. He was graduated at Harvard Medical School in 1883, joined the Massachusetts Medical Society the following year and went abroad to study medicine further, serving as house officer at the Rotunda Hospital in Dublin, Ireland. On returning, he settled in Nashua, where he practiced until shortly before his death. He was a member of the New Hampshire Medical Society and of the American Medical Association, also of the Nashua Board of Education, serving as president. He had been in poor health for some time previous to his death.

# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### THE ANNUAL DISCOURSE.*

NOTE.—At an adjourned meeting of The Massachusetts Medical Society, held Oct. 3, 1860, it was

*Resolved*, "That The Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

*Resolved*, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

### SOME OF THE MUTUAL RELATIONS BETWEEN THE PHYSICIAN AND THE COMMONWEALTH.

BY F. W. ANTHONY, M.D., HAVERHILL, MASS.

APPRECIATING the honor of being chosen the orator of the day, an honor that to my mind carries with it the obligation to attempt to render you a real service, I long considered the question of the subject of my oration. I chose the one I shall today present to you—"Some of The Mutual Relations between the Physician and the Commonwealth."

There are four controlling instincts in human life—the instinct of self-preservation, the herding instinct, that of procreation, and the desire to exercise freely one's own will—self-determination.

Think, if you will, of a man alone upon an uncharted and unknown island. He represents absolute freedom. Bound by no laws, he may follow his own sweet will. The necessity of providing for himself food, shelter, fuel and clothing, or of suffering the consequences of a failure so to do, being the only compulsion. He may wander at will. He may work as many or as few hours as he may choose. He may carry out the primeval instinct of absolute independence and of yielding to no one a jot or a tittle. Imagine, now, that to this island comes a second person. The whole situation is changed. "Meum" and "tuum" now exist. There must be coöperation—or the relation of master and dependent. Boundaries and rights must be settled by force or else by mutual agreement. The realm of law has come into existence. If the inhabitants increase, the question becomes more complex. Development will come along one of two lines—that of autocracy with promulgated law, or that of democracy with the law of the majority starting first as custom and being later developed into the written law of the land.

Let us assume that, in the case of our imaginary island, democracy is the outcome, what is the rational procedure? Individual desires are curbed. The good of the whole is the criterion. Cables, factions, and combinations may exist, each striving for power and control—for the primeval instinct in combination is identical with that in the individual, but the will of the majority is the law, and, when declared and set forth, must, to be effective, be supported, if necessary, by force.

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* Delivered before the Massachusetts Medical Society, June 1, 1921.

In community life, even on an island such as we have described, there will be inequalities. Mental power will not be an unvarying quanity: the ability to plan, to carry out, will vary. There will be combinations of the powerful to gain more power, and of the weak for mutual protection. The combination of the powerful may be wise, or intolerant and unjust. The combination of the weak may be ineffective and unwisely expressed, or it may gain power and become, in turn, intolerant and unjust. The safety—more, the very existence of tolerable life depends on one factor alone—the intelligence, the education and the high purpose, not so much of groups in combination as of the community as a whole.

This principle applies, not alone to the island we have been considering, but, in equal or greater measure, to the hamlet, the city, the State and the Nation. So long as the great body of citizenship is sane, the community life is safe.

While, theoretically, the principles I have laid down are applicable to Nations, to the world as a whole and even to a series of worlds, practically we have to limit its application when our unit reaches the boundaries of a Nation, for the simple reason that, to be effective, its *modus operandi* must be understandable by the majority of those whose interests are involved, and its democratic bases be a part of the life experiences inherited from their progenitors. It is impossible for us to view the world through the mental vision of the Chinese, the hordes of deepest Africa, the Hindu, or, perhaps, even that of the inhabitants of certain parts of Europe.

I have described law as "custom expressed in words"; but note an important addition—custom expressed in words and *made effective*. The will of the majority must be enforced upon those who, in the exercise of what I have termed the primeval instinct of self-will and determination, desire to resist this majority will. Hence have arisen, by necessity, officers of the law, judges to interpret it, police and soldiery to carry out its provisions. It may happen,—it has frequently happened,—that, for the instant, a minority may secure enough adherents to become a majority—in which case there naturally follows a change in the law. Under many circumstances this is not to be deplored, but often marks progress, and must occur until the Divine law,—law founded on omniscience and omnipotence, becomes the law of the world.

While laws deal with many questions that are local or individual, there are certain laws that are charged with matters of public interest,—for example, those relating to the production of food, fuel, and clothing, the necessities of existence, and those concerned with the public safety. In the pronouncement and enforcement of these laws, the community has a special, a vital interest. The production of the necessities of life must go on in order that the community may live; the transportation—that there may be an interchange of products and there must be assurance of the safety of human life, in order that repose of mind, and not constant anxiety, may be our portion. Hence, when any man, or group of men, threatens these fundamentals, the community, aroused, expresses its will and must be obeyed.

When, in Kansas, one man said to the State, "Unless you at once comply with our demands, Kansas shall freeze," Kansas had a Governor who, as quoted by one of his constituents, replied, in substance, "We have the Golden Rule, but we also have the Ten Commandments, many of which begin, 'Thou shalt not,' " and the will of the people of Kansas, as a whole, expressed in the acts of its men and women through new but absolutely legal methods of procedure, prevented a catastrophy at which the world might well have gaped aghast.

More recently, when the capital of this Commonwealth was threatened with mob violence, we had, fortunately, in the chair of the Governor, a man who had the courage to say, "Thou shalt not"; and the great common people of this old State leaped to uphold his hands representing, as they did, the authority of law and order, and, later, recorded their opinion in a manner so emphatic that it could not be misunderstood, even in the farthest hamlet of the State, yea, of the Nation.

On the other hand, not long ago, when a group of capitalists banded together to form a monopoly in the control of certain essentials to human existence, the Supreme Court of the United States, interpreting the law and will of the majority of the people, said, in effect, "Thou shalt not,'' and ordered a dissolution of the trust.

Few sane men in this day are opposed to organization to improve conditions, to make life more a thing of comfort and happiness, to secure of personal or group advantage the maximum consistent with the welfare of the public as a whole. But to any group, whether of labor, of capital, or of other interests that may say to the community, ''Our interests are to be advanced, no matter at what cost of suffering and danger to you,'' the community will reply, ''Thou shalt not,'' and, if necessary, enforce the command. Were this not true, life would be intolerable, because it would be encompassed by a continuous guerilla warfare between factions.

That this community ''Will'' be wise and well considered implies, of necessity, that the great majority of those composing it shall be decently educated, and able to comprehend the underlying principles that make government and invest it with power. Hence, everything that tends to educate the citizen body is valuable, yes, indispensable; and by education, I mean a knowledge that includes not only the fundamentals of history and of government, but, as well, a knowledge of those matters the acquisition of which, develops mental power and also the ability to evaluate the subject under consideration.

Since it is impossible for a large body like the State to register the opinion of its citizens by individual expression, there has been devised a system of legislatures where the representatives, elected by the people, are supposed to formulate into laws the opinion of those whom they represent. Theoretically, the law making ensemble is representative of its constituents; if, however, it chances that it be composed of those who are chosen, not by the deliberate judgment of the majority of the people, but by the chicanery of self-seekers for the responsible position, through the method of what is known as ''practical politics,'' or by organization founded on, or supported by, an appeal to the baser elements, and nourished by appeals to passion or prejudice, other dangerous conditions come into existence. Hence the importance that every man and every woman not only exercise his or her prerogative of voting by using the ballot for the advancement of sane and sensible legislation, but also that he and she take personal interest in the selection of those who are to be balloted upon as candidates for high office.

The law, in the interest of public safety, regulates certain professions. Today we are considering the medical profession. The will of the people has been expressed in law that compels the citizen who would practice medicine to have a definite amount of preliminary education and training,—in this State a miserable minimum that places us near the bottom of the list of States and prevents reciprocity; it compels registration; it lays down certain conditions; it establishes definite restrictions under which alone can certain acts be performed; it provides punishment for an infraction of the criminal law; it gives the aggrieved patient the opportunity for civil procedure and for the recovery of pecuniary damages in the event that the professional accomplishment is below the level of the average skill and ability possessed by the practitioners in the community where the physician resides; under the same penalty it punishes neglect of obvious duty. In one recent year over 8% of all the physicians of this State were either sued or threatened with suit. This does not indicate a decline in medical ability, but in many cases, is the result of the knowledge on the part of a despicable group of harpies that insurance companies can be plucked better before their death, which death is now widely predicted. I am unable, after consultation with some of the best legal minds in the Commonwealth, to offer any suggestion for legislation that can relieve the situation, unless it be partially relieved as a corollary of a plan I will later offer you for your consideration—affording relief in much the same manner that the business man is now protected under the Compensation Act.

Because it has granted to the physician certain privileges and rights, restrictions of the field and a degree of legal protection, the community expects that the physician shall, in re- the coin of the realm; and, since the early days, turn, give some service that is not paid for in the physician has recognized this as a duty and has also esteemed it a privilege to play his part in the work done for the general good. Practical defects, however, have arisen. The community has, at times, by an increasing number of its members, demanded such excessive service that the problem of existence for the physician has been a difficult one. The natural result has followed. The group of younger physicians has manifested an increasing restlessness under these conditions and, to some extent, has gone to the other extreme, so that many of its members have taken the position that service without pecuniary recompense is not to be rendered, and that the public shall provide payment for all service that cannot be paid for by the individual. Calls that seem doubtful are declined and work is limited in hours, particularly at night. Situations have arisen of marked hardship; the community has grown restless under this attitude and has been seeking in various directions for a remedy,—health insurance, community centers, increased hospital facilities,—all have been taken up and are still being debated. The question is a complex one. A man, improvident and spendthrift, has little right to demand from the profession a major part of its time and attention, to the exclusion of the opportunity for the individual physician to provide properly for himself and for his family. On the other hand, community spirit calls for the expenditure of the maximum of charity in time of individual or group poverty or distress. To establish the proper line of cleavage is a task for a mental giant, and yet I have sufficient faith in the force of the traditions of the profession and of the examples of the past to believe that, when a just solution is offered, the medical profession will, in the future, as in the past, live up to the full measure of those who have gone before, and do its part—yes, more than its part,—asking only that, in view of this service, the community also exercise its charity to a high degree.

There is one class of the community that is now cared for by the State,—those in public institutions established and maintained for State dependents who are sick physically or mentally. That the State should properly assume this obligation has not been disputed; that a large measure of their care falls upon the profession in these institutions there is no doubt; that the profession as a whole is ignorant of the necessities and needs of such patients is a regrettable fact. It should understand them, not only as a matter of sociology, but also because this burden of care, which might have been placed, under certain State systems, upon each practitioner of the State, has been concentrated in this Commonwealth under the care of a few.

There are two ways of considering the problem of the State charges. One is to consider that, being without means to pay for their care and treatment, whatever they may receive is better than they have a right to expect. This point of view is cold and brutal; on the other hand is the belief that, since the State has assumed this burden, it should bear it in such a manner that recipients of its bounty may receive the highest skill obtainable and the most tender care—with two objects in view: First, reconstruction of as many as possible, in order that they may again become self-supporting and of productive value to the State; and, second, in the event that this is impossible, that suffering may be alleviated and the environment made, not luxurious, but with a full measure of comfort. It necessarily follows that, in order to accomplish this, there must be the construction and maintenance of sufficient hospitals and institutions, their equipment for the particular purpose intended, including highly competent staffs, and a corps of nurses and attendants of proper education and training, and also, what is of paramount importance, there must be found in these institutions the proper spirit of service to humanity. To obtain these desiderata, it is a self-evident corollary that the recompense must be enough to attract men and women of proper mental and moral grade.

Let us look at the field. There are at present, in Massachusetts, seven special institutions for the care of the physically sick, with a total capacity of 4,045 beds. In 1919, the average per capita cost was $15.62 per week. The average salary of the physicians was, with maintenance, from $1200 to $3900; the salary paid graduate nurses, including the head nurse, ranged from $600 to $1320 a year; the average salary for attendants was about $540. There are 14 institutions caring for the mentally ill, two of which are not wholly supervised. The average per capita cost for 1919 was $6.35 per week. In 1919, the average wage of nurses and attendants was $500.76 per year; there have been some changes since that time. The number of patients on November 1st, 1920, was 18,611. In the fall of 1920, to provide adequate institutions and adequate beds, the Department of Mental Diseases recommended special appropriations amounting to $2,400,000, requesting provisions for nearly 600 additional patients. These are figures enough to give you an idea of the magnitude of the medical problem involved. The method of meeting these problems is, in brief, as follows: Each institution has its unpaid Board of Trustees, appointed by the Governor and confirmed by the Council. Under almost every administration, the selection of these trustees has been absolutely non-political—a very easy matter when there is no financial recompense attached to the position. The men and women represent, as a rule, leaders in business life, in social welfare, and in the medical and legal professions. By these boards, the needs of each institution are carefully considered, a budget is made up, submitted to the State Board having jurisdiction, by whom it is considered in the light of the needs of the State as a whole, and sent to the Supervisor of Administration, who forms his conclusions. It is then presented to the Joint Committee of Ways and Means, who consider it in the light of the State income and make their recommendations to the Legislature. I believe it to be true that the majority of the legislature desire to do what is right and wise for the charges of the State, but the needs are so many that perhaps it is inevitable that budgets prepared as carefully as possible by the boards of trustees, some members of which are keen business men, are materially cut when the appropriations reach the final stage. In some cases, the result is very unfortunate. Let me illustrate. At the State Infirmary at Tewksbury, there are about *340* children, over 200 of whom are, by mental tests, shown to be substandard mentally. There is at the institution a hospital of *100* beds for children. The rest must be scattered among the other branches of the institution, much to the detriment of the children themselves. Moreover, with the facilities at hand, it is impossible to separate those of higher mentality from those of the lower type. Defective delinquents, one of the problems of the day, are a constant source of anxiety and of danger. Proper facilities for what education can be given these children are not at hand. Basement rooms are utilized, and everything is done that is possible under the restrictions placed upon the appropriations by the State. For *ten years* the trustees have annually called attention to this condition in their report. Meetings of sub-committees with heads of departments have been held, all of whom have agreed that the condition was intolerable and that the remedy should be applied, but today the condition remains as it was in 1910. In March of this year, the Trustees went personally before the joint committee on Ways and Means and set forth the urgent need and the unfortunate conditions that demanded relief. The request was again denied—with a suggestion that some (insufficient) relief might be obtained when a building in another part of the State was completed. Note the anomaly —A Board of Trustees, sworn to guard faithfully the interest of State charges and, for ten years, prevented from full accomplishment of this duty by the authority that placed responsibility upon them. I am not minimizing the fact that during these ten years this matter might well have been taken up in an aggressive manner by the departments responsible for custodial care, but in the last analysis the funds must be appropriated by the legislative body.

The Trustees of one of the State hospitals have repeatedly called attention to the need of facilities in State hospitals for patients not strictly State dependents but able to pay for somewhat increased comforts a small sum in excess of the actual per capita cost. No action upon this request has been taken. While these incidents might be multiplied, did my time permit, they serve to illustrate one of the points that I wish to emphasize, namely, that to accomplish definite results the medical profession must have a sufficient knowledge of these questions to enable them to exercise their undoubted influence as individuals with the members of the legislature in order that the best type of work may be done by the State. I believe that this Society might well have a standing committee on State medical problems in order that such problems be properly studied and the profession as a whole enlightened on subjects—not trivial, but vital.

In considering a community in reference to its medical needs, we may divide it into three classes, the rich, the dependents and the middle class. The rich can provide for themselves. The dependents are now provided for by the city, county or State. The class requiring the most careful consideration by us is the middle class. This class can again be subdivided into those able, with frugality and prudence, to arrange for, and pay for, the care of their sick and aged, and those unable so to do. No class is fixed. The rich man of today may be the dependent of tomorrow; and the dependent of today may rise to a self-supporting station.

In the middle class, also, conditions of employment or of health may cause an individual to rise above, or fall below, the self-supporting line. The size of a family is a factor in this varying status. So long as the strength of the nation is believed to be based, in part at least, upon the size of its population, so long as law-making bodies and certain religious denominations maintain that the teaching or practice of contraception is against public policy or proper religious belief, so long, as a natural consequence, will the community be obliged to aid those who function in the free yielding to the procreative instinct without regard to their financial ability to sustain and care, in times of distress, for those whom they have brought into the world. This is not the time or place to argue for or against the wisdom and righteousness of such rulings and beliefs. We must accept the facts and formulate our plans upon their existence.

I know of no better starting point than, somewhat arbitrarily it is true, to decide upon a wage which may today be accepted as sufficient to support a man, his wife and three children, which we will assume is a reasonable family, since the average family in Massachusetts consists of four and four-tenths individuals. That the wage sufficient in 1912 would fall far short in 1919 is true; that it must vary from time to time because of the varying purchasing power of the dollar is equally true. After consulting many who have special opporportunities for acquiring knowledge, and after studying the tables of several investigations, I am going to assume for the purpose of this paper, that, in 1920, the minimum wage upon which a man, wife and three children can be cared for in a prudent, decent American way is $1500.

Wages are based, not upon the size of the family, but upon the law of supply and demand. The first question that naturally arises in a given case is, "Does the man or woman, or family, exercise frugality?" We cannot take away all responsibility from the individual. A person who refuses to practice any measure of self-denial should not feel that the community will take up all of his or her responsibility. The community must see that actual severe suffering does not occur, and it does this now through the measures in existence for the relief of the dependent class. He who, regardless of the future, enjoys all the pleasures of today must, on the morrow enter the class in which he finds himself properly classified.

As a necessity, then, for proper classification, comes the knowledge of the status of the individual (married or single), the size of the family, the earnings of the past year, and also the conditions of that year—that is, reference to whether there were unusual and not to be foreseen expenses, as, for example, severe and incapacitating illness or accident. In other words, before we can act intelligently, we must know whether or not the inability to provide at a given time for personal distress, or the distress of a family requiring medical aid, is due to unavoidable conditions, including insufficient wage. This also affects the suestion of credit. It may be necessary for the State to further establish the minimum wage as a protective measure. Remember that we have eliminated the rich and the dependent, which latter class includes those so mentally deficient that they are incapable of self-support. In an average year, the State dependent class in Massachusetts represents 89,273 individuals, or approximately 17,850 families.

We must, without question, or inquiry, relieve at the time of its existence, urgent suffering, but to carry on treatment for a period of time, we also must have a proper understanding of the conditions surrounding the individual and the home; then we can place the financial responsibility where it belongs,—on the individual, his blood relatives, who, if financially able should assume their part, or upon the local or the State community.

Here we meet at once with an obstacle. No man likes to confess himself improvident or reckless, nor can he often judge himself mentally deficient if so he be; he may hesitate to make known the fact that he has been living under unusual conditions. This obstacle is, however, not so great as at first it might seem, for the individual is always at liberty to provide for himself and his own, and only when the community must provide for him in whole or in part, is there any justification for an inquiry into his affairs. Moreover, such an inquiry should be conducted, not along the line pursued in years past, and, perhaps, in some communities today, by the average Poor Department—the line of minimizing aid, but rather along the line of effort to learn of the conditions of the necessity and to meet these in such a manner that, as soon as possible, they be again made normal. It would be of small ultimate value to bring the temperature of an enteric to normal and in a week to send him from a hospital to be forced, in his weakened condition, to resume at once hard labor, with a resulting breakdown, and of small value to treat a septic right hand and discharge the patient in three weeks with fingers contracted so that they are not of economic value. So it is of small value to give free service and treatment to a needy family unless we can determine the *cause* of the need and, to such a degree as is possible, formulate plans for betterment of future conditions, while we utilize the best service in professional power to restore those afflicted. We require for ideal results, a coördination of community factors, including the medical profession. It is self-evident that the physician in private practice has not the time, nor perhaps the ability, to determine all the facts in a given case. There must be then constituted some body, or individual equipped for such a purpose. That such a method is not impossible was demonstrated in the late war when, not ideally in every case, but successfully in a large measure, Boards appointed by the Government determined the question of health and dependency in relation to service. Let us assume for a moment, that an agency existed that was charged with the duty of determining the matters under discussion. First, appearance before such an agent or agency should be voluntary, leaving to the individual the highest measure of personal freedom. Second, the evidence presented should be strictly confidential under heavy penalties for the disclosure of matters presented. Third, it should have the facilities to render medical relief with no publicity other than to the State or community department charged with the appropriation of funds.

The total population of Massachusetts is about 3,693,310 individuals, which represents about 826,490 families, since the average family consists, as I have said, of 4.4 individuals. It is estimated that 671,490 families receive an income of less than $2,000 a year. It is fair to state that, under the present method, about 400,000 families, or nearly 2,000,000 individuals, receiving an income insufficient to pay for the expense of sickness,—namely, under $1500 per annum,—are medically cared for neither by the community as a whole nor by themselves, in times of sickness, but, when ill, are given free treatment by the physicians of the Commonwealth. It is estimated that 422,000 of these will require medical attention in a given year. The maximum estimate of licensed practitioners of Massachusetts is 6,000. This gives an average of 70 free patients to each physician. If the average illness in a community is in duration, as statistics show, six days per annum, we might fairly estimate the average number of calls made by a physician upon cases of this class to be about 420 per annum, or about three in two days; and I believe your experience will bear out the approximate accuracy of these figures. This represents in money, at the prevailing charges, without any consideration being taken of special work requiring special skill and at special rates, a gift by the physicians of the Commonwealth of $7,596,000. This is a very low estimate since it assumes that only 25% of the members of the class considered will require medical attention. Of course, even these figures ures represent averages, certain physicians do much more, and others much less than their proportionate part.

I believe that the physicians of the Commonwealth will not complain of this burden—and burden it certainly is—but I believe that, in view of their contribution, they have a right to say to the community, "Taking into consideration the fact that we are giving our services to 2,000,000 of our fellow citizens, services estimated most conservatively as over $7,000,000, we believe it is only just that the community do certain things: First, as an economic necessity, provide means to restore to health as rapidly as possible those afflicted with remediable conditions; second, lift from the shoulders of the physicians the care of chronic and incurable cases such as fall in this group." The latter request is not necessary to press since, in Chapter 304 of the Acts of 1919, the way is already open, this act providing that chronic and incurable cases, without reference to settlements, must be received at the State Infirmary, for which cases payment will be made either by the individual, the community where there is a settlement, or the State, according to the proper source for payment, as shown by investigation. The first request is certainly reasonable, and it can be granted without prohibitive expense, as I will endeavor to show.

There are times when most of us realize that individually we know little; collectively, much. The physician competent to do, himself, major surgery, orthopedic surgery, genito-urinary surgery, eye, ear, nose, and throat work, ideal obstetric work, mental work, neurological and gynecological, as well as general medicine, is hardly existent. This is the dawn of group medicine. The general practitioner, gladly assuming his part of the work in the community, feels that he must have at his disposal special knowledge to restore as soon as possible the sick and injured to a normal condition. Probably 80% of cases requiring special skill are able to be moved. If, then, we had a central hospital ideally equipped both in staff and in equipment for the highest type of expert work, much would be accomplished to relieve the situation. In an average year it is a liberal estimate to say that in Massachusetts, among the class, not dependents, but earning under $1500 a year, 422,000 will require medical attention. It is a liberal estimate to say that 338,000 of these will be ill with trivial ailments which require ordinary skill. This leaves 85,000 who would require special treatment. Of this, about 80,000 would require hospitalization with an estimated average stay of 15 days, requiring therefore 3,333 beds for their care. In this State, there are approximately 200 hospitals, semi-public or municipal, having a capacity of about 15,225 beds, of which on a given day, about 8,000 are in use, many occupied by paying patients. This does not include the State institutions. There are about 33 municipal hospitals with a capacity of 4,000 beds. The waste of 50% of hospital beds in the State can, I believe, be overcome in the elaboration of the plan I will continue to outline, provided that communities not having municipal hospitals, or having such hospitals inadequate to supply local needs, can obtain coöperation from the semi-public institutions, and, since they are under State license, this should not be difficult.

If 10% of hospital cases require medical service of so expert a character as not to be available in local hospitals, then provision at a central hospital would have to be made for about 330 beds, which, under ordinary hospital averages, would care for 5,000 individuals annually. If we assume that the serious conditions of these patients require double the average hospital stay, that is 30 days, the beds mentioned would provide for about 2,500 patients per annum. I estimate roughly 100 beds might be devoted to surgical work; 100 to medical, 75 to electrotherapy, 20 to neurological work, 20 to obstetrical work, and 15 for disorders of the ear, eye, nose and throat.

To construct the accommodations would cost, at the present time, approximately as follows:

| | | |
|---|---|---|
| Building | $500,000 | |
| Equipment | 80,000 | |
| Total | | $580,000 |
| Yearly State Expense: | | |
| Upkeep and repairs | $5,000 | |
| Administrator | 6,000 | |
| Six specialists | 48,000 | |
| Transportation of patients 6 ambulances | 10,000 | |
| District salaries (6) | 18,000 | |
| Office Administration | 10,000 | |
| Making a total of | | $97,000 |

Estimating the cost per patient of food, medicine and nursing, and including house officers, at $30 per week the total annual expense, assessed back upon the local communities, would be $520,000, a considerable per cent. of which would be saved in the expenses at the local hospitals.

Bearing in mind that the estimate of service given now by physicians to members of this class of the community was most conservatively given as over $7,000,000, taking from this the annual cost to the State and to the communities as a whole under the plan I have evolved, there is still left to be borne by the physicians of the State, service estimated as approximately $6,000,000. I have not been developing a plan to free them from any large degree of community service, but rather to make that service more effective.

The practical detail of this plan would involve dividing the State into six districts, each having a physician, responsible to the State hospital, selected by its Trustees, and with authority to place in local hospitals, properly equipped for real service, upon the request of the member of his class requiring aid, or his physician, such cases, in the class we are considering, as are in need of hospital care; to transfer to the central hospital such cases, able to be moved, as may require skill or experience above that locally available, and to summon as consultant such special skill from the central hospital when the patient in need cannot be moved with safety. This representative should be held responsible for the determination of the fitness of the individual to receive the benefit, in order that the privilege be not abused. It is not intended that he give medical service personally. The actual cost of all cases placed in local or central hospitals should be paid by the community from which the patient comes, but into this cost should not be counted the salaries and administrative expense of the central hospital, nor its transportation facilities. By this plan the initiative lies with the individual, expressed directly or through his physician; personal freedom is not interfered with; each community bears its own burden; the State provides expert facilities and administrative function. Communities now outlying to hospitals already established, of proper grade, might well arrange for the use of their citizens, additional rooms and buildings if sufficient facilities were not available, paying the full per capita cost of such service. There must, of necessity, be at the central hospital an administrator of this function, to whom all subordinates would be responsible.

The location of the State Central Hospital, manned by experts, might well be a matter of debate. Boston is the hub of the Commonwealth; Worcester is its geographical center; Newton, approximately the center of population. At Tewksbury, is a State Infirmary, functioning, equipped to receive all classes of cases and requiring, to include the class we are considering, but minimum expenditure of State funds since much of the organization is already developed and the grounds available. The work would be of extension rather than of new construction; if two central hospitals were provided for, the expense would be tripled.

The objection to a Boston center is the difficulty of correlating diverse interests; to a center in Worcester, the necessity for developing a large organization; to Tewksbury, its geographical position and the fact that the association on the same grounds of the State charges, and the class under consideration might, for sentimental reasons, be opposed; although the fact that chronic incurable cases are now received under payment as well as free, does away with much of this objection, since the admission of the incurables is constantly increasing in number. The great bulk of the patients would come from east of Worcester. An efficient ambulance service could handle the situation. It must also be considered that the addition of a group of this importance, carrying with it the gathering together of the highest grade of expert physicians, would enable the State to utilize this service, to such a degree as might be necessary or advisable, in the care of the more than two thousand physically and mentally disabled wards of the State now under care at that institution. The advantage to be gained by the State in every direction would seem to me to make the development of the State Infirmary along these lines a valuable asset for the Commonwealth itself in its administrative as well as its welfare work.

I appreciate the difficulty of establishing a staff of the proper calibre but, with a sufficient remuneration, it could be done. If the Legislature attempted to fix salaries on a low basis, the plan would be absolutely useless. Its success presupposes enthusiastic, high grade men in charge of departments. They must be men whom the profession as a whole regards with confidence. On them would hinge the success of the proposed measure of relief. Their selection should be made by the Trustees of the hospital and be based only upon the factors of ability and the proper humanitarian spirit, a combination difficult, but not impossible to obtain.

Will you note that through all this plan lies the fundamental idea of *service*, and service given in high measure by the physicians of the Commonwealth? It is not "State medicine" as heretofore thought of.

Service to others is the justification for existence, and it is the best contribution we can make to the world as we pass through its experiences. The fact that it has been given, is the solace of that hour, which comes to everyone, when the house is hushed and the white-capped nurse goes about her tender ministration; and, when the ear grows dull and the eyes dim as they strive to see once more the faces dearest on earth, the fact of this attempted service robs of much of its terror the final scene. Whether, when the eyelids are closed and earth is for us no more, the next moment be oblivion, or whether the faith and hope of ages past be justified and death found to be the beginning of life—in either event, our duty has been well performed. If our faith and hope prove justified, then the "Well done, good and faithful *servant*,'' may glorify our awakening.

We render service to the individuals forming the community and the Commonwealth. We ask the community and the Commonwealth to aid us in such service as is beyond our power to render. Is this not a fair request?

I care not how the details are worked out so long as the underlying bases are not disturbed, namely, the establishment of individual need, the freedom of individual action, responsibility placed as required on the individual, the blood relation, the local community or the Commonwealth, the selection of experts free from all extraneous influence.

I do not assume that this is the last word. I believe it to be superior to the plans for Health Insurance that have been proposed. It has closely related with it other problems which it may help to solve. One of these is the question of State aid in maternity work, because, if the difficult cases, early recognized by means of proper prenatal observation, were cared for at the central hospital, the fact of the possibility of this care would stimulate the plans considered for obtaining early the necessary data in obstetric work; and another — that of the rehabilitation of the vocationally disabled — a large field in industrial accident work which is at present only touched upon in its working out, and one which might be developed in connection with the surgical and the electro-physiotherapeutical service at this institution. In matters of detail the plan may be open to argument. In any event, it is offered to you as the conclusion arrived at after a year's special study of the problems involved—a progressive placing of responsibility, with the Commonwealth the culminating factor in rendering service, otherwise unobtainable, in such a measure as means the highest advantage.

The Commonwealth of Massachusetts has, in the past, always found the members of this Society ready to respond to its call in time of danger or distress, offering service and, if necessary, life. The distress of the poor in time of peace is often nearly as great as in time of war. I am pleading for those who, having neither opportunity nor, perhaps, ability, cannot plead for themselves. In their behalf, I plead with the Commonwealth to give them measures of relief, nor do I think I usurp authority when I say to the Commonwealth, "I pledge the hearty coöperation and help of the great majority of the physicians of the State in any feasible plan.'' Service *for* the Commonwealth and Service *by the* Commonwealth, is the crux of the "Mutual relation between the physician and the Commonwealth of Massachusetts.''

Among those to whose courtesy I am indebted in my effort to obtain data for this paper, I am glad to express my appreciation of the aid obtained from Lee Frankel, P.H.D., and Louis I. Dublin, P.H.D., of the Metropolitan Life Insurance Company; Robert Kelso, formerly Commissioner of Public Welfare; George M. Kline, M.D., Commissioner of Mental Diseases; John J. Mitchell, Collector of Internal Revenue; Irving L. Shaw, State Income Tax Collector; Fancis D. Donoghue, M.D., Medical Advisor to the Industrial Accident Board; Mary E. P. Lowney, Assistant Director to the Industrial Accident Board; Walter P. Bowers, M.D., State Board of Registration in Medicine; Richard P. Borden of Fall River; Fred Magison of Haverhill; Bertram Bent, Claim Examiner of the Fidelity and Casualty Co.; John H. Nichols, M.D., Superintendent and Mr. Thomas F. Flynn, Treasurer of the State Infirmary.

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## Original Article.

# THE ESSENTIAL FACTORS OF CANCER CAUSATION.

By James W. Shannon, M.B., San Diego, California.

*(Continued from page 548)*

According to the Mortality Report of the U. S. Bureau of the Census for the year 1917, the rates and percentages of cancer incidence upon organs and parts of the body are as follows:

| | Rate per 100,000 Pop. | Per Cent. |
|---|---|---|
| Cancer of the buccal cavity .... | 3.0 | 3.7 |
| Cancer of the stomach, liver ... | 31.1 | 38.1 |
| Cancer of the peritoneum, intestines, rectum ............... | 10.9 | 13.3 |
| Cancer of the female genital organs ...................... | 12.4 | 15.2 |
| Cancer of the breast .......... | 7.6 | 9.3 |
| Cancer of the skin ............ | 2.9 | 3.5 |
| Cancer of other organs, or organs not specified .......... | 13.8 | 16.9 |

These figures show that, whereas 83.1 per cent., or five-sixths, of all cancers appear in structures which together constitute only a small part of the body, namely, in the skin, female breast, and the alimentary and female generative systems, only 16.9 per cent., or one-sixth, remain to be distributed among all the other structures of the body. It must be remembered also that, even in those organs which are specially liable to cancerous disease, nearly the whole weight of its attack is borne by certain points which, in comparison to the size of the whole organ, seem to be almost insignificant. Thus, for instance, the great majority of cancers of the female generative system appear on the cervix uteri; of the alimentary system in the region of the pylorus, and of the skin at certain points on the face and hands. Since, in view of these and other similar facts, we cannot doubt that cancer is a local disease or that the conditions present in certain organs or parts of organs are more favorable to its causation than in others, it becomes necessary to consider how and why it happens that the conditions favorable to the causation of the disease are not present in an equal degree in all organs and parts of the body.

From what has been said concerning the rôle of lesions and water in the causation of cancer, it is obvious that the presence of both these factors is a condition common to all parts and organs of the body which become the seat of the disease. If it is true that the causative agent of cancer exists in water and that it gains access to the living cells of the tissues through a lesion in the protective surfaces of the body, it follows that the chances of cancer arising at the site of any lesion depend—other things being equal—upon the degree of exposure of such lesion to water. Lesions have no inherent tendency to become cancerous, and so long as the protective surfaces of the body are intact water cannot act upon the living cells of the tissues; hence, neither lesions alone nor water alone is able to cause the disease. Cancer results only from the coöperation of lesions and water, and only those conditions which contribute, not to the causations of lesions or to their exposure to water, but to the *coöperation of lesions with water,* can properly be regarded as its predisposing causes. All conditions, therefore, such as age, sex, habit, custom, occupation, etc., which heretofore have been regarded as predisposing to cancer, are, in a strict sense, predisposing causes not of cancer, but of lesions only. It is only in a few cases, as, for example, x-ray work, when it happens that habit, custom, occupation, etc., perform a double part: firstly, by contributing to the causation of lesions, and, secondly, by favoring their exposure to water, that they are entitled to be considered as really predisposing to cancerous disease.

More than one-half—55 per cent.—of all cancers arise in the alimentary system, *i.e.*, in the buccal cavity, stomach, liver, peritoneum, intestines, or rectum, and of these, more than two-thirds,—69 per cent.,—are found in the stomach. It is estimated that cancer of the stomach is three times more frequent than of any other organ or part of the body, and, as the above figures show, gastric cancers constitute more than one-third of all cancers. These facts are undoubtedly remarkable, but it is even more remarkable that, in an overwhelming proportion of cases, the attack of cancer is directed towards one small part of the stomach, namely, the pyloric region. In the absence of reliable data, it is impossible to determine exactly what percentage of cancers are situated in the pyloric area, but inasmuch as 38 per cent. of all cancers arise in the stomach, it is probably not an exaggeration to say that cancer of the pylorus constitutes 30 per cent., or nearly one-third of all cases of cancerous disease throughout the body, and somewhat less than two-thirds of all cancers of the alimentary system. It is, however, a matter of minor importance whether these estimates prove to be justified or not, since in any event the fact remains that the liability of the pyloric region to cancerous disease far exceeds that of any other part of the body, regardless of its size or situation. Other parts of the alimentary system attacked in undue proportion are the buccal cavity, the duodenum and the rectum. Cancers of the pharynx, esophagus, intestines, and peritoneum occur comparatively seldom, and primary cancer of the liver and pancreas is rare.

*(To be continued.)*

## Book Reviews.

*Feebleness of Growth and Congenital Dwarfism.* By Dr. Murk Jansen, O. B. E. London: Henry Frowde. Hodder and Stoughton. 1921.

This volume, "Feebleness of Growth and Congenital Dwarfism," is an attempt to work out two main principles: (1) that injurious agents affecting growing cell-groups enfeeble their power of growth: (2) that the measure in which growth is enfeebled is proportional to the rapidity of growth. The author has shown how the similarity between "Rachitis" and "Achondroplasia" may be determined by these principles which account also for other conditions developing before or after birth. The first part of the book deals with growth-changes which develop after birth; the second part considers congenital growth-changes, with which, inasmuch as they are incompatible with extra-uterine life, the practitioner is much less familiar. Anencephaly, achondroplasia, mongoloid, idiocy, dysostoses, cleido-cranialis and congenital club-foot and congenital dislocation of hip are discussed and are illustrated by many excellent plates.

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## MATERNITY LEGISLATION.

May 21, 1921.

Walter P. Bowers, M. D.
Managing Editor
Boston Medical and Surgical Journal,
Boston, Mass.

Dear Doctor:

Recently the Boston Medical and Surgical Journal invited open discussion on certain subjects. A subject of the greatest importance to Physicians concerns Materunity Legislation which is now before the U. S. Senate.

I have previously sent you a copy of the briefs I presented to the Massachusetts Legislature, as you had requested I should do, but as yet I have seen nothing of them in the "Journal."

I am sending you herewith a copy of the brief I presented to the U. S. Senate Committee on Education and Labor, May 5, 1921. If it is your desire to invite discussion on matters of importance I shall expect you to publish this brief in the very next issue of the "Journal." I mention the "next issue" because discussion at this time is very important on account of the coming meetings of the M. M. T. and the A. M. A.

Let all arguments pro and con be heard.

A controversy is interesting only when both sides are equally informed.

Differences of opinion amongst Physicians should find expression in our Medical Journals; a legislative hearing is not the best place to develop them. When Physicians disagree with Physicians, when Physicians disagree with Health Authorities in the presence of legislators, is it surprising that these legislators should afterward turn a deaf ear to other good health problems? Is it surprising that some really good bills advocated by practically all Physicians have been turned down? Let us have a clearer conception and understanding of our own problems and then stand together if such a thing is possible. Let us at least argue amongst ourselves before arguing in public. No one sided opinion should alone be heard nor assume to be right.

If Physicians are to subscribe to maternity legislation they must consistently subscribe to the whole problem of Social Health Insurance. If they are opposed to Social Health Insurance in toto, then they must consistently be opposed to maternity legislation which is only a part of the whole. Physicians must either stand for or against Poternobism as related to the practice of medicine. Which shall they do? Discussion is necessary that the right decision may be made.

Kindly publish this brief which is in opposition to maternity Legislation; likewise I would be pleased to read any arguments in favor of same.

Very truly yours,
A. H. QUESSY, M. D.

Note: Copy of brief referred to as having been forwarded was never received.

Editor.

## *Brief Read Before The U. S. Senate Committee on Education and Labor, May 5, 1921, by A. H. Quessy, M. D., Fitchburg, Mass.*

Gentlemen of the Committee:

The Study of Maternity Legislation is now before the Nation. Physicians cannot and should not remain silent when action and free discussion are imperative to set the Nation right on this subject. A controversy is interesting only when both sides are equally informed.

Well may we ask from what source or sources comes this proposition for Maternity Legislation? It is far from being popular. There is no evident demand for it on the part of the great American public; capital and labor are not demanding it; physicians throughout the country are opposed to it. Women of the Nation are not clamoring for it, excepting a few only who have money to burn and time to lose to favor certain pet projects, amongst which is Maternity Legislation. Women with the large families, the real reproducers, are not seeking it. Who are those few women who favor Maternity Legislation; who are those few self-constituted champions of so called women's rights? They are women, many of them married or without children. They are mostly members of Women's Societies. These women claim to be the representatives of their sex, but who, may we ask, invested them with that authority.

The arguments for Maternity Legislation have been placed before you and the Nation in glowing colors. Marvelous results have been promised and upon these promises the proponents have gained support. Do not be led astray. Maternity Legislation is a huge fabrication of inflated, socialistic and wrong ideas, and its only claim to public attention is because, like many other forms of propaganda, it has been cleverly popularized in the minds of some people, who with the best of intentions are allowing the heart to dominate the brain. Maternity Legislation is in error, it will not and can never give the promised results because Maternity Legislation is based upon wrong premises and because the cause and remedy for Maternal and Infant Mortality is being sought at the wrong source. Let us not be guided by false sympathy, nor be led into error when we know that physicians, nurses, Medical educators, Departments of Health, Nursing Associations, Child Welfare Organizations, Women's Leagues, Hospital Staffs, and numerous other agencies have been in the past and are now actively at work to protect the Health and life of the Expectant Mother and her off-spring.

Maternity Legislation comes from an erroneous idea in the minds of some people based upon questionable statistics, that the health of the American nation has gone far below the universal standard, and that prènatal and postnatal care, and maternal and infant hygiene are the sole panacea for all our evils. We are sick and tired of social reforms which are constantly being foisted on us to cure us of what ails us when nothing at all out of the ordinary is the matter with us.

Maternity Legislation has just been defeated in the Massachusetts Legislature. The Physicians of Massachusetts were strongly opposed to it, and they are equally opposed to Maternity Legislation, be it State or Federal. The American Medical Association whose membership is made up of Doctors from every State in the Union is opposed to Maternity Legislation. Furthermore, the principles concerning Maternity Legislation were voted upon and not approved by the council of the Massachusetts Medical Society. We are told that Maternity Legislation is favored and endorsed by certain women's organizations. Much publicity has been given to only one side of this question; public sentiment easily reflects the work of propaganda. Endorsement on a bill does not guarantee that this bill is 100% correct, nor that it has been well understood, neither does it mean that the endorsers are the best judges. Maternity Legislation is purely a medical problem, the value and necessity of which cannot be better judged than by physicians.

Physicians oppose Maternity Legislation, State or National:

1. Because Maternity Legislation is unnecessary and superfluous.

2. Because it is not really a Health measure as it is claimed. It is essentially socialistic in tendency as it is in Germany and elsewhere, and we don't want socialism parading in this nation under the guise of health measures.

3. Because Maternity Legislation and its accompanying bills are in error and are exaggerated.

4. Because they are based upon assumptions which are fundamentally wrong.

5. Because they point to the wrong cause of and the wrong remedy for Maternal and Infant Mortality.

6. Because they are a direct attempt to give autocratic power to the department of health in each State where advisory power alone should prevail.

7. Because they are an entering wedge to State or National control of the practice of medicine.

8. Because they are an invasion on the realm of private rights, personal liberties and constitutional safe-guards.

9. Because present day methods are giving and will give better results than any form of Maternity Legislation that may be proposed; the burden of proof to the contrary is up to the proponents.

10. Because this Legislation is coming up at a very inopportune time; a feeling of unrest and dissatisfaction exists in our land; our government was founded upon true democracy, guaranteeing to every man his rights and privileges Recently our Country went to war, our soldier boys faced death that Autocracy should perish and Democracy should endure. Can it be that we were wrong in fighting for Democracy in the face of so many later attempts to introduce Autocracy? Maternity Legislation leads to Socialism; Socialism leads to Bolshevism; Bolshevism leads to Anarchy. The Physicians most strongly oppose Maternity Legislation because it leads the way to Socialism and because it is radically wrong.

11. Because Maternity Legislation in other countries is a poor example for America to follow. The Doctors of Austria are starving; the Doctors of Germany are in open rebellion; the Doctors in England are much dissatisfied.

12. Because State or National control of the practice of Medicine would be harmful.

   1. It eliminates competition—there is no incentive to become skillful.

   2. It would not be necessary to build up a practice.

   3. There would be less revenue for the skillful and competent man.

   4. There would be less incentive to study medicine and fewer doctors in the future.

   5. The young man will be driven to other and better fields of endeavor.

13. Because as stated by a Brother practitioner in Massachusetts, "Maternity benefits or Legislation is paternalism, communism, Sovietism, and all the other isms of the kind condensed into one. It is the entering wedge for all the various forms of compulsory insurance such as Health, old age, sick-

ness, etc. It is the camel's head in the tent, soon to be followed by the rest of the camel. It makes the white man the equal of the Indian, a ward of the State or Nation. The State or Nation has as much right to pay my Grocery bill as to pay that under discussion."

14. Because in all the shuffle resulting from Maternity Legislation, the good and trustworthy physician will be lost, expectant Mothers will be turned over to amateur consultants and advisory committees, and God help the women in confinement if they are, and God help the American people, if during the Influenza epidemic in 1918, the Physician had been lost in some such shuffle.

15. Because Maternity Legislation is in error and based upon wrong premises. When Dr. Oliver Wendell Holmes was asked at what time he would begin prenatal care, he replied "Two hundred years before the child is born." Heredity therefore plays a very important part and physical imperfections are handed down from generations which cannot be changed by prenatal and postnatal care, nor by the ridiculous methods proposed by Maternity Legislation. Whether we are willing to admit it or not, the true cause of impaired physical energy lies in our moral and social conditions. According to ministers of all denominations, the lack of morality is deplorable in this country as well as elsewhere. Venereal diseases are affecting the health of womanhood and manhood. Slavery to fashion and pleasure are lowering the general health and powers of resistance, making girls arrive at the stage of Motherhood, weak, anemic, ill-nourished, nerve-wrecked, deformed and very often unfit to bear children.

If the proponents of Maternity Legislation are really in earnest in their endeavors to better the human race, the Expectant Mother and the Off-Spring, I would suggest that they devote the same amount of energy in advocating and encouraging more religion, better living and working conditions, better morals, better habits, better protection by right dressing, less dancing, less theatres, more fresh air, less burning of the mid-night oil, and many other things too numerous to mention. The results obtained would fade into insignificance the proposition for Maternity Legislation.

16. Because Legislation cannot be depended upon to reduce Maternal and Infant Mortality. Even if it were 100% efficient women would still die in confinement, and Infants would still die before or after birth, no matter what the skill of the obstetrician or the laws that might be enacted. It is a law of nature to die and nothing can prevent certain deaths. Medical science in all these years has progressed without State or Federal control; it does not need State or Federal control to continue.

17. Because Maternity Legislation is wholly and radically wrong, and the bills now up for consideration, and any substitute bill cannot be partially right.

18. Because the Sheppard Bill (S1039) is apparently identical with the report made by a Special Commission to the Massachusetts Legislature. This report was thrown aside by the Massachusetts Legislature, and therefore, the physicians of Massachusetts are opposed to the Sheppard bill (S1039). Bill S1039 is very cleverly worded, but potentially it is as far reaching in State control as was any bill ever yet presented. It is objectionable and should be opposed. All that can be said against Maternity Legislation in general applies equally well to Bill S1039 or any of its kindred substitutes.

19. Because in addition, this Maternity bill stipulates, under Section 1, that its purpose is to *promote the care* of Maternity and Infancy in the several states. Now, what is meant by, and what is there underlying, the word *"care"?* This word is not clear; it is vague; its interpretation involves much latitude of thought and ideas. What real meaning is disguised by this word? If medical service, if hospital service, nursing service, medicines, etc., are involved in the interpretation of the word *"care,"* we object. The whole practice of obstetrics thus becomes condensed or centralized in this one word *"care."* This part of the bill is objectionable because it establishes a foundation upon which to build future state or national control of the practice of obstetrics.

20. Because there is *danger* in this bill when its purpose is to provide instruction in the hygiene of maternity and infancy and its *related subjects.* There is grave danger in assigning to a nurse duties which far exceed the scope of her training. There is still greater danger in providing for non-technical instruction as specified in the bill under Section 9. A nurse is a nurse, she is not a Doctor. Advice and instruction should be given to women during pregnancy by Physicians, not by nurses nor by persons non-technically trained. Physicians know better than anybody else the conditions and facts in the case and are better qualified to advise and instruct regarding the signs, dangers and treatment or care of eclampsia and other diseases. Nurses cannot properly interpret the analysis of urine and much injury may be done pregnant women by injudicious advice or instruction in kidney, heart or other complications. The diet must be under the direction of a Physician for he knows what foods containing this or that element are necessary for proper foetal development and the preservation of the Mother's physical welfare. In fact, the care of pregnant women belongs to properly trained instructors and Physicians alone are

properly trained to instruct pregnant women. Advice in hygiene, though important, is secondary and should be carried out by the nurse under the direction of the Physician only.

Gentlemen, ask yourselves what you would prefer to do concerning the person dearest to you, your wife. Would you prefer to seek advice and instruction for her from a Physician who knows something, or from some person who knows nothing?

21. Because instruction in *subjects related* to maternity and infancy, as provided for in section 9, would be a probable means of circulating literature or advice accompanied by unwelcome and unwise intrusion into the most intimate of private affairs, and what guarantee have we that this would not be done? What guarantee have we that, amongst other evils, birth control cult would not find here a fertile breeding place? A proponent in Massachusetts has already said: "We want quality, not quanity." Would the brazen advice to refuse to bear children, flaunted before the women of this nation by one of their own sex, be passed along as the best means of preventing death from childbirth? And if these disseminators of information should choose to go so far, who is going to follow them from home to home to check them?

We refuse to place our confidence in non-technical, amateur and unscientific instructors, especially in *subjects related* to maternity and infancy, and we refuse to subscribe to any proposed legislation which might make possible these things.

22. Because any state which passes a similar act must, in order to secure federal appropriation, accept the provisions of this federal bill and thereby accept federal supervision.

The Children's Bureau of the Dept. of Labor is to be charged with the carrying out of the provisions of this act. This means, under Section 8, that any state must submit to the Children's Bureau in Washington for its approved detailed plans for carrying out the provisions of the Act; these places, it is stated, shall be in conformity with the provisions of the Act and will not be approved until due notice of such action is sent to the State by the Children's Bureau. Not much choice nor freedom of action is left to the State by virtue of Section 8.

If this is not placing in the hands of the Children's Bureau in Washington the whole obstetrical situation in both Nation and State, then what is it? If this is not providing insidiously for future national control of obstetrics, then what is it?

23. Because according to information gleaned from the latest report of the Department of Commerce, the public debt of the United States apportioned among all people, men, women and children, makes a debt of $235.40 for each and every American to pay. And in the same report one learns that the Federal government took $62.42 per capita to keep the wheels of government running in 1920, and in 1916 it was but $7.62. We therefore believe that his Excellency, Governor Cox of Massachusetts has struck the right chord when in newspaper items he is reported as saying: "Assistance is being asked from the State to help along work that ought to be done or carried on by the individual or family. It is our duty to ask ourselves whether the benefits secured from State aid will justify public expenditure. Careful analysis often discloses that it is far better for the Commonwealth to refuse State Aid than to grant it." These words apply equally well to Federal Aid. It seems that Uncle Sam's debt is now large enough without making it larger without good and sufficient reasons. If any additional expense is to be voted let me express the hope that it will be in favor of our ex-service men.

24. Because we believe in the motto "Law and Order" which made famous, Ex-Governor Coolidge of Massachusetts now Vice-President of the United States. Physicians cannot and must not strike with any more justification than did the policeman in Boston. But if it is wrong that policemen should strike, if it is wrong that physicians should strike, then it is just as wrong to impose upon them working conditions or conditions of State or National servitude which would be repulsive and unbearable. Justice must be dealt out if law and order shall be guaranteed.

25. Because Physicians cannot believe that it is necessary to give autocratic power to the different States in order to continue preventive work. Are we to believe that our whole structure is obsolete and must crumble to make way for the imaginary scheme of social reforms? No. Past achievements in the line of preventive medicine without State or Federal control lead us to the conclusion that we must not pause but continue. We must renew our courage and pursue our object with added energy by following that same path which has brought glory to the practice of medicine in America and will lead to further and greater achievements.

Gentlemen, the 10th amendment to the Constitution declares that the powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively or to the people. The people who hold reserved powers are the people of each and every State. To them and to their States certain powers are reserved. Are these reserved powers subject to be taken away by three-fourths of the States through the amending process? This union must be a union of States held together by a National bond that was formed through the establishment of a central authority for certain limited purposes, and a most important part of the strength of the whole system consists in the recognition of local and personal rights, without which there can be neither peace nor progress, nor security, nor public tranquility, nor private happiness. It is time to rebuke these tendencies of opinion and feeling which indicate dissatisfaction with the political institutions that for a period of 140 years have guarded this country in a course of development, prosperity, and happiness that is unexcelled.

The doctrines favoring the centralization of power in Washington are becoming more and more obnoxious to the thinking people. The doctrines advocated by Thomas Jefferson and Abraham Lincoln favoring a government of the people, by the people and for the people are gaining in their hold upon the public mind and heart. The people of this country are becoming intensely jealous of their rights as communities, of their inalienable rights as sovereign citizens.

In other words, the centralization of all power in the Federal government at Washington is distasteful to the people's sense of justice, and thoroughly out of harmony with their views of liberty.

No trade or profession can claim more self-abnegation than the medical profession. Physicians are far from being selfish, day and night, they administer to the needs of the sick; the poor have always found the Doctors their friends. Doctors have voluntarily co-operated in all measures which would really improve the general health, knowing fully well that by so doing, they were reducing their own source of revenue. They subscribe to preventive medicine, they believe in it for the sake of humanity, but when it comes to handing over the practice of medicine to State or National control, or transferring it to amateurs and incompetents, physicians most strongly object.

A. H. QUESSY, M. D.
Fitchburg, Mass.

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## AMERICAN MEDICAL ASSOCIATION PROGRAM OF CLINICS.

### MONDAY MORNING, JUNE 6.

### BOSTON CITY HOSPITAL

10 A. M. to 10.15 A. M. Dermatological Demonstrations in the Amphitheatre. Drs. Townsend W. Thorndike, William P. Boardman and M. C. Von Groll.

10.15 to 12.00. Diseases of the Stomach and Gall Bladder. Diagnosis and Treatment. Demonstration of the various methods used to arrive at a diagnosis. Gall Bladder Drainage, Stomach and Duodenal Analysis and X-ray. Patients used for demonstration. Drs. Franklin W. White, Francis W. Palfrey and John A. Foley, Diseases of the Heart.

### BOSTON DISPENSARY

10 A. M. General Dermatological and Syphilological Clinic. Hereditary Cases and Administration of Arsphenamine. Dr. Henry J. Perry and Associates.

*Genito-urinary.* Treatment of Acute and Chronic Gonorrhoea. Dr. Arthur H. Crosbie and Associates.

10.30. Routine Surgical Treatment of Men, Women and Children. Operations on Children. A. Incarcerated Omental Epigastric Hernia. B. Undescended Testicle. C. Other available cases. Dr. Hilbert F. Day and Associates. D. Arthroplasty on Ankylosed Jaw. Dr. Roy H. Gilpatrick.

*Orthopedic.* Claw-Foot, Resection of Metatarsal Heads. Dr. John D. Adams. Giant Cell Tumor of Femur—Bloodgood Operation, Dr. B. E. Wood. Spondylolisthesis—Reduction. Infectious Arthritis of Knee with Deformity, Dr. C. C. Carrell.

*Dental.* Exhibition of Post Operative Cases, Surgical Treatment of Pyorrhoea Alveolaris, Dr. Charles M. Proctor and Associates.

*General Medical Clinic.* Diagnosis Treatment, etc., Dr. W. E. Preble and Associates.

*Lung Clinic.* Diagnosis Treatment, of Pulmonary Tuberculosis, Dr. E. O. Otis.

*Gastro-enterological Clinic.* Diagnosis and Methods with Illustrative cases, Dr. Louis Fischbein.

*X-ray.* Some unusual Gastro-Intestinal Plates, Chest Plates of Children, Dr. Herman A. Osgood.

*Rectal.* Office Treatment of Rectal Diseases, Drs. F. P. Williams and T. C. Hill. Ionizatio Treatment of Pruritus Ani, Dr. William A. Rolfe.

12 noon. Ward Visit. Infants and Children, Dr. Allan R. Cunningham.

### BOSTON LYING-IN HOSPITAL

10.30. Operations, Dr. DeNormandie. Ward Visit, Dr. Huntington. Pregnancy Clinic, Dr. Irving.

### BOSTON PUBLIC SCHOOLS

9 A. M. Open Air Classes at:—(3 classes) 5th St., near C St., South Boston. George F. Hoar School. Peter Faneuil School. (1 class) Joy Street. West End, Boston. Washington School. (2 classes) Corner Norman and South Margin Street, West End, Boston. School Physicians and Nurses will be present to explain the work.

### PETER BENT BRIGHAM HOSPITAL

10 A. M. Diagnosis and Treatment of Bright's Disease. Drs. Henry A. Christian and James P. O'Hare. The Relation of Protein Sensitization to Disease. Dr. J. Chandler Walker.

### CARNEY HOSPITAL

10 A. M. Medical Clinic. Gynaecological Operations, Dr. F. W. Johnson.

### CHILDREN'S HOSPITAL

9 A. M. to 12.00. Surgical Operations: Dr. James S. Stone and Staff. Empyema, hernia, harelip, cleft palate, webbed fingers, and other available cases to be announced at Hospital. The surgical out-patient clinics will also be open each morning and various cases of interest may be seen.

10 to 11.30. Surgical Clinic, Surgical Staff.

10 A. M. to 10.15. Cervical Adenitis, Dr. G. D. Cutler.

10.15 to 10.25. Hemangioma, Dr. T. H. Lanman.

10.25 to 10.40. Gaucher's Disease, Drs. W. E. Ladd and C. Foote.

10.40 to 10.50. Tumor of the Bladder, Exstrophy of the Bladder, Dr. C. G. Mixter.

10.50 to 11.10. Pyloric Stenosis, Dr. W. E. Ladd.

10.10 to 11.30. Umbilical Sepsis, Dr. J. S. Stone.

11.30 to 1. Medical Clinic, Dr. John Lovett Morse and Assistants.

### FORSYTH DENTAL INFIRMARY FOR CHILDREN

9 A. M. to 12.30 P. M. Orthodontia. Nose Throat and Oral Surgery.

### HOUSE OF THE GOOD SAMARITAN

10.00 A. M. Medical Clinic. The Founding and Running of a Chronic Hospital. Its needs and place in the community. Dr. A. K. Stone, Chief of Staff. Ward Visit. Cancer and Heart Cases. Drs. William David Smith and Francis P. Denny.

10.00 A. M. Orthopedic Clinic. Dr. Robert Souther.

### INFANT'S HOSPITAL

10 A M. to 6 P. M. Nursing Technique. Milk Modification. X-ray Plates of Pulmonary Tuberculosis. Influenza Atelectasis with Clinical and Autopsy Findings.

11 A. M. Medical Clinic. Diseases of Infants.

10 A. M. Clinic.

### INDUSTRIAL CLINIC. LIBERTY MUTUAL INSURANCE CO., 210 Lincoln Street, Boston

8 A. M. to 6 P. M. Clinic for Care of Industrial Injuries and Diseases, Demonstration of Equipment and Methods.

### MASSACHUSETTS GENERAL HOSPITAL

9-12. Surgical Operations by the Staff, Bigelow Amphitheatre.

12-1. 10 minute clinics as follows: Bigelow Amphitheatre, Tendon Grafting and Suture: Dr. Torr W. Harmer. Traumatic Osteitis of the Carpal Bones of the Wrist: Dr. Mark H. Rogers. Syme's Amputations, End Results and Early Weight Bearing: Dr. Philip Wilson. Pyelitis of Pregnancy: Dr. E. G. Crabtree. Lympho-Sarcoma of Kidney: Dr. H. H. Crabtree. Radum in Cancer of Prostate: Dr. G. G. Smith.

11-12 Clinico-Pathological Conference. Pathology Amphitheatre, Dr. F. B. Talbot and Dr. E. L. Young, Jr.

12-1. Clinico-Pathological Conference. Pathology Amphitheatre, Dr. W. H. Smith.

### MASSACHUSETTS HOMEOPATHIC HOSPITAL

10 A. M. General Surgery, Orthopedic Surgery, Surgery of the Nose and Throat.

### ST. ELIZABETH'S HOSPITAL

10 A. M. Operations: General Surgery. Genito-Urinary Surgery. Orthopedics: Display of Pathological Specimens and X-Ray plates. Medical Ward Visit.

### NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

10 A. M. Surgical Operations.

11 A. M. Nose and Throat Department. Adenoid and Tonsil Operations, Submucous Resection of Nasal Septum, Demonstration of Cases.

10 A. M. Ward Visits. Infant Feeding, Rickets. Dr. Wright.

9 A. M. Maternity Department. Inspection of Building.

10 A. M. to 12. Prenatal Clinic Rooms. Four demonstrations of half hour each. Regular prenatal examination of a patient applying for admission will be made with short discussion of the approved value of it.

*Delivery Suite.* Four demonstrations of half hour each. Regular Hospital preparation for delivery will be demonstrated. A description of the routine after care will be given.

Nurseries. The Infant's Bath and toilet will be demonstrated. Any abnormalities present at the time will be demonstrated.

## Monday Afternoon and Evening, June 6.

### BOSTON CITY HOSPITAL

1.30 P. M. to 3.30 P. M. Demonstration of History taking? Physical examination, function test, electrocardiograph, X-ray, etc. Drs. William H. Robey, Thomas J. O'Brien, Burton S. Hamilton and William D. Reid.

3.30 P. M. to 4.00 P. M. Diseases of the Thyroid. History, Diagnosis and Treatment, Basal Metabolism and X-ray Treatment. Demonstration of Patients. Drs. Frank H. Lahey, Howard Clute, W. Richard Ohler, Norman Osgood and Louis J. Ullian.

5.00 P. M. to 5.30 P. M. Social Service.

5.30 P. M. to 6.00 P. M. Diseases of the blood. Diagnosis and treatment. Demonstration of patients and smears, etc., Dr. Ralph C. Larrabee.

### BOSTON DISPENSARY

2.00 P. M. Laboratory Department. Drs. W. A. Hinton and J. C. Janney. Food Clinic. Demonstration of Methods. Miss Bertha M. Wood.

3.00 P. M. Children's Medical Clinic and Infant Feeding. Dr. Elmer W. Barron.

7.30 P. M. Genito-Urinary, Gynecological, Syphilis, Dental. Health Clinic: Demonstration of Methods and Results on 400 cases. Dr. Lesley H. Spooner and Assistants.

### BOSTON FLOATING HOSPITAL

40 Wigglesworth Street.

2-4.00 P. M. Malnutrition in Infants—Demonstration of Plant and methods. Dr. H. I. Bowditch.

### PETER BENT BRIGHAM HOSPITAL

2.00 P. M. Dr. S. Burt Wolbach, Typhus Fever. Dr. Francis W. Peabody, Vital Capacity of the Lungs in Heart Diseases.

### CHILDREN'S HOSPITAL

2.00-3.30 P. M. Surgical and Neurological Clinic. Obstetrical Lesions of Spinal Cord, Dr. B. Crothers. Hydrocephalus and Spina-bifida, Dr. G. D. Cutler.

3.30-4.30 P. M. Throat Clinic—demonstration with routine operations. Dr. D. Crosby Greene, Dr. Herman, Dr. Meserve.

4.30-5.30 P. M. Dental Clinic. Dr. Blumenthal. Dento-facial orthopedia.

2.00-5.00 P. M. Surgical Operations. Empyemia, Hernia Harelip, Cleft-Palate, Webb fingers and other available cases. Dr. James S. Stone and Staff.

### COLLIS P. HUNTINGTON MEMORIAL HOSPITAL.

2.00 P. M. Dr. R. B. Greenough. The Cancer Commission of Harvard University. The use of radium in the treatment of malignant disease.

2.15 P. M. Dr. W. Duane. Radium.

2.30 P. M. Dr. G. R. Minot. Radium in the treatment of leukemia.

2.45 P. M. Dr. C. C. Simmons and Dr. E. M. Daland. Carcinoma of the skin.

3.00 P. M. Dr. G. G. Smith. The use of radium in the treatment of carcinoma of the prostate and bladder.

3.15 P. M. Dr. W. T. Bovie. Experimental work in light.

3.30 P. M. Dr. E. W. Goodpasture. Certain changes in the bone marrow in cases of carcinoma.

3.45 P. M. Dr. J. H .Wright. The Free Diagnosis Service.

4.00 P. M. Dr. G. A. Leland. Radium in the Treatment of Carcinoma of the cervix.

5.15 P. M. Dr. C. C. Simmons. Treatment of carcinoma of the buccal cavity. Radium in the treatment of Hodgkin's disease.

4.30 P. M. Dr. D. C. Greene. The Treatment of carcinoma of the nose and throat.

### FORSYTH DENTAL INFIRMARY FOR CHILDREN

2.00 P. M. Dental Extracting and Prophylaxis. Research. Showing Effects of Vitamine Deficient Diet on Teeth, Bones and Joints. Exhibition of Specimens, Sections and Photographs.

### INFANT'S HOSPITAL

2.00-6.00 P. M. Nursing Technique, Milk Modification, X-ray Plates of Pulmonary Tuberculosis. Influenza Atelectasis with clinical and autopsy findings.

### INDUSTRIAL CLINIC. LIBERTY MUTUAL INSURANCE CO.,

210 Lincoln Street.

8.00 A. M. to 6.00 P. M. Clinic for Care of Industrial Injuries and Diseases. Demonstration of Equipment of Methods.

### Throat Department. Mass. General Hospital

At the Harvard Medical School Amphitheatre in Building D.

2.00-4.00 P. M. Dr. Mosher: Demonstration of Casts of the Oesophagus. Dr. Kerr: Exhibition of Plaster Casts of the Face. Dr. Barnes: Demonstration on the Cadaver of Operation for Malignant Tumors of the Accessory Sinuses. Application of Radium. Exhibition of Cases showing End Results. Dr. Mosher: Demonstration on the Cadaver of Lachrymal Sac Operation.

### THE EAR DEPARTMENT, MASS. EYE AND EAR INFIRMARY

Oto-Laryngological Section Clinical and Anatomical Demonstrations will be held at Harvard Medical School, Amphitheatre Building D.

4.00-6.00 P. M. Case Histories. Dr. E. A. Crockett. A case of Lateral Sinus Thrombosis and Temporal Abscess, Dr. L. E. White. Methods of Teaching Surgery of the Mastoid as Employed at the Harvard Medical School Dr. C. B. Faunce. New Canal Flap for the Radical Cavity. Dr. D. C. Smyth. Lantern Slide Demonstration of Oto Sclerosis, Dr. H. P. Cahill. Lantern Slide Demonstration of X-ray Plates of the Mastoid, Dr. A. S. MacMillan.

### BOSTON DISPENSARY.

Health Clinic

7.30 P. M. Demonstration of methods and results on 400 cases, Dr. Leslie H. Spooner and Associates. Syphilis and Administration of Arsphenamine. Dr. Henry J. Perry and Associates. Treatment of Acute and Chronic Gonorrhoea, Dr. Arthur H. Crosbie and Associates. Treatment of Gonorrhoea in Women, Dr. A. K. Paine. Dental. Exhibition of Post Operative Cases. Surgical Treatment of Pyorrhoea Alveolaris. Dr, Charles M. Proctor and Associates.

## Tuesday Morning, June 7.

### BOSTON CITY HOSPITAL

9.30-11.30 Operations by Drs. D. D. Scannell, W. E. Faulkner, F. B. Lund, F. J. Cotton, H. A. Lothrop, J. C. Hubbard.

11.30-12.30 Demonstration and discussion of cases.

11.30. Dr. Lund. Facial nerve anastomosis, Freeing of musculo spiral nerve in fracture of humerus. Intermedullary bone graft, Gun shot wound hip with fracture of acetabulum, Avulsion of heel, pedicle graft, Carcinoma of tongue, stomach, breast, Acute pancreatitis, Chronic pancreatitis.

11.45 Dr. F. J. Cotton. Typhoid rib infection, positive culture, 2 cases, Skull fracture, Hip fracture, Fracture of calcis, Fracture scaphoid, Hip arthrodesis, Knee arthroplasty, Knee septic, tenoplasty, Knee osteomyelitis, patella, Perfect recovery of function, Knee infection, streptococcus hemolyticus, irrigation, closure, recovery, Elbow septic joint, Recovery under Williams technique, Osteomyelitis Tibia, total, ideal operation, recovery, Pelvis injury, perineum split open with gut protrusion, etc., recovery, Two stage pedicle graft, leg to sole of foot, Hallux valgus, Keller operation, Breast carcinoma, proper type operation, early function, Massive ascitis, Talma omentopexy substantial relief lasting for months.

12 M. Dr. W. E. Faulkner. Resection of intestine following perforating bullet wound of abdomen, Fascial transplant in hernia repair.

12.10 Dr. I. J. Walker. Case cancer of jaw with disection of the neck. Two cases of osteomylitis, one following compound fracture of the tibia, the other infection of the ankle joint, Two Cases of repair of the sigmoid by the Balfour method, One case of Echinococcus.

12.20 Dr. R. C. Cochrane, Removal bullet from pericardium.

12.25 Dr. F. Henderson. Two stomach cases.

During the operations appropriate methods of anaesthesia will be demonstrated by Dr. J. E. Butler, F. L. Richardson and L. F. Sise, the Visiting Anaesthetists.

### BOSTON DISPENSARY.

9 A. M. Dental. Exhibition of Post Operative Cases. Surgical Treatment of Pyorrhea - Alveolaris. Dr. Charles M. Proctor and Associates.

10 A. M. Surgical. Routine Treatment of Men, Women and Children. Dr. Hilbert F. Day and Associates.

*Orthopedic.* Routine Clinic Cases. Flat-feet types of Arthritis. Schlatter's Disease.

*Spinal*—Postural Cases—Back strain—Results of Hibbs Operation. Separation of Epiphysis—Tuberculosis of Hip. Dr. John D. Adams and Associates.

*Genito-urinary.* Treatment of Acute and Chronic Gonorrhoea. Dr. Arthur H. Crosbie and Associates.

10.30 A M. General Medical Clinic. Diagnosis, Treatment, etc. Dr. W. E. Preble. Anaphylaxis Clinic. Protein Vaccinations and Vaccine Treatment. Dr. Emile A. Barrier. Heart Clinic. Diagnosis of Heart Conditions, with Illustrative Cases. Dr. W. B. Reid. Diabetic Clinic. Treatment of Diabetes Mellitus, with Illustrative Cases. Dr. F. Gorham Brigham. Ear, Nose and Throat. Routine Office Treatment. Dr. Frederick C. Cobb and Associates. Treatment of Gonorrhoea in Women. Dr. A. K. Paine. Nerve and Mental Clinic. Routine. Dr. A. Warren Stearns.

12 Noon. Ward Visit, Infants and Children. Dr. Elmer W. Barren.

### BOSTON PUBLIC SCHOOLS.

9.00 to 10.45 A. M. Open Air Classes. George F. Hoar School. (3 classes) 5th St., Near C St., South Boston. Peter Faneuil School. (1 class) Joy St., West End, Boston. Washington School. (2 classes) Corner Norman and South Margin Street, West End, Boston. School Physicians and Nurses will be present to explain.

### BOSTON PSYCHOPATHIC HOSPITAL.

9.00 to 11.00 A. M. Demonstration of the Treatment of Cases of Neurosyphilis. Dr. Harry C. Solomon. Demonstration of Psychiatric Out Patients. Dr. Douglas Thorn.

11.00 to 12 Noon. A Clinical Demonstration of the Nervous Disorders of Childhood. Dr. C. Macfie Campbell.

### PETER BENT BRIGHAM HOSPITAL.

9.00 A. M. Brain Tumors, Dr. Harvey Cushing. Renal Infections, Dr. William C. Quinby.

### CARNEY HOSPITAL.

9.00 A. M. Gynecological Surgical and Orthopedic Operations.

10.00 A. M. Medical Clinic.

### CHILDREN'S HOSPITAL.

9.00-12.00. Operations: Empyema—Hernia—Harelip—Cleft palate—Webbed fingers and other available cases. Dr. James S. Stone and Staff. Surgical Out-Patient Clinic will also be opened each morning and various cases of interest be seen.

9.00-11.00 Surgical Clinic. Surgical Staff.

9.00-9.15 Elbow fractures. Dr. James S. Stone.

9.15-9.35 Harelip and cleft-palate. Dr. William E. Ladd.

9.35-9.50 Tumors of Chest. Dr. James S. Stone. Dr. L. W. Smith.

9.50-10.05 Undescended Testes. Dr. C. G. Mixter.

10.05-10.25 Tumors of Kidney. Dr. C. G. Mixter.

10.25-10.40 Intussusception. Dr. James S. Stone.

10.40-11.00 Abdominal Cysts. Dr. William E. Ladd.

11.00-12.30 Medical Clinic. Dr. John Lovett Morse and Assistants.

12.30-1.00 Neurological Clinic. Lesions of the Lenticular Neucleus. Dr. B. Crothers.

### Children's Hospital. Harvard Infantile Paralysis Commission Clinics.

10.00 to 11.00 A. M. Demonstration of the work of the clinic: a. Muscle training in operation. b. Spring balance muscle testing in use. c. Exhibition of operative and results. d. Routine of Clerical part of clinic: Charts, record and follow-up system. Dr. Robert W. Lovett.

11.00 A. M. to 12.30 P. M Repetition of the above clinic.

### FORSYTH DENTAL INFIRMARY FOR CHILDREN.

9.00 A. M. to 12.30 P. M. Nutrition Clinic. Endocrine. Dental Orthopedics.

### INFANT'S HOSPITAL

9.00 A. M. to 6.00 P. M. Exhibition of X-ray Plates of Pulmonary Tuberculosis. Influenza Atelectasis with clinical and autopsy findings. Nursing Technique. Milk Modification.

10.00 A. M. Medical Clinic. Disease of Infants.

### INDUSTRIAL CLINIC, LIBERTY MUTUAL INSURANCE CO.,

210 Lincoln Street.

8.00 A. M. Clinic for care of Industrial Injuries and Diseases. Demonstration of equipment and methods.

### MASSACHUSETTS GENERAL HOSPITAL

9.00 to 11.00 A. M. Surgical Operation by the Staff —Bigelow Amphitheatre.

11 A. M. to 12.00 Noon. 10-minute clinics as follows: Dr. Hugh Williams: Cases of gall bladder surgery. Dr. G. W. Holmes: Therapeutic use of X-ray in inoperable carcinoma. Dr. R. B. Greenough: Results of operation for carcinoma of the breast. Dr. W. J. Mixter: Cases of spinal cord tumor. Dr. G. W. W. Brewster: A case of chylus ascites. Dr. J. D. Barney: Recurrent renal calculi. Dr. C. A. Porter: Relative values of medicine, X-ray, and surgery in Graves' Disease.

12 Noon Dr. J. Collins Warren: The True Meaning of "Ether Day", October 16, 1848.

### MASSACHUSETTS GENERAL HOSPITAL

Medical Clinics—lower Out-Patient Department Amphitheatre.

9.00-9.10. Dr. R. Clifford: A case of lymphoma of the mediastinum.

9.00-9.20 Dr. W. R. Sisson. Mouth deformities in rickets.

9.20-9.40 Dr. P. D. White. Auricular fibrillation.

9.40-10.00 Dr. F. B. Talbot. Pediatric Clinic.

10.00-10.20. Dr. F. M. Rackemann. Asthma and hay fever.

10.20-10.40. Dr. F. T. Lord. Non-tuberculous pulmonary cases.

10.40-11.00 Drs. J. B. Hawes and G. W. Holmes. Relation between clinical and X-ray findings in diseases of the lungs.

11.00-11.20 Dr. W. H. Smith. Visceroptosis.

11.20-11.40 Dr. R. S. Eustis. Cardiac diseases in children.

11.40-12.00 Dr. W. G. Holmes. X-ray treatment of goiter.

12.00-12.20 Dr. F. G. Brigham. Diabetic Clinic.

12.20-12.40 Dr. G. R. Minot. Cases of blood disease.

12.40-1.00 Dr. E. S. O'Keefe. Eczema in children.

Upper Out-Patient Department Amphitheatre. Neurology, Dermatology, Syphilis.

10.00-11.15 Demonstrations of Dermatological and Syhpological cases by members of the Dermatological and South Medical Departments.

11.15 Dr. Stanley Cobb. Treatment of Paralysis Agitans.

11.30 Dr. J. B. Ayer. Demonstration of Cister Puncture.

Clinico Pathological Conference. Pathological Amphitheatre.

12.00-1.00 Dr. R. C. Cabot.

### MASSACHUSETTS HOMEOPATHIC HOSPITAL.

9.00-11.00 General Surgery.

11.00-1.00 Orthopedic Surgery.

### ST. ELIZABETH'S HOSPITAL.

10.00 A. M. Operations: General Surgery. G. U. Surgery. Orthopedics. Medical Ward Visit. Display of Pathological specimens and X-ray Plates

### NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN.

9.00 A. M. Surgical Operations.

11.00 A. M. Nose and Throat Department. Adenoid and Tonsil Operation. Submucous Resection of Nasal Septum. Demonstraton Cases. Maternity Department.

9.00. Inspection of buildings.

10.00-12.00 Prenatal clinic rooms. 4 demonstrations of half hour each. A regular prenatal examination of a patient applying for admission will be made with a short discussion of the proved value of it.

*Delivery Suite.* 4 demonstrations of half hour each. The regular hospital preparation for delivery will be demonstrated. A description of the routine after care will be given.

*Nurseries.* The infant's bath and toilet will be demonstrated. Any abnormalities present at the time among the babies will be shown.

9.00-12.00 Demonstration of Cases. Medical. Dr. Denig. Dr. Bigelow. Dr. Wright. Neurological. Dr. Ordway. Dermatological. Dr. Cummins. Neurological, Dermatological. Drs. Ordway and Cummins. Possible relation between skin and nervous symptoms.

## Tuesday Afternoon, June 7.

### BOSTON CITY HOSPITAL

2.00-4.30 Operations, Drs. J. J. Walker, E. H. Nichols, E. B. Young, H. Binney, F. H. Lahey, H. B. Loderm, A. R. Kimpton, R. C. Cochrane, Demonstration and discussion of cases.

4.30 Dr. E. H. Nichols, Removal of dural endothelioma, Resection of lower jaw.

4.40 Dr. F. H. Lahey, Intrathroracic goitre with tracheal deviation.

4.50 Dr. Osgood.

5.00 Dr. H. B. Loder, Sarcoma shoulder, Hemangioma of the leg involving the fibula.

5.10 Dr. A. R. Kimpton, Tumor of the carotid gland. Splenectomy, Hodgkins disease.

5.20 Dr. H. H. Howard, Carcinoma of the penis, 4 cases.

### BOSTON DISPENARY

2. P. M. Laboratory Department, Drs. W. A. Hinton and J. C. Janney. X-ray. Some unusual Gastro-Intestinal Plates, Chest Plates of Children, Dr. Herman A. Osgood. Food Clinic. Demonstration of Methods, Miss Bertha A. Wood.

3 P. M. The Care and Feeding of the Boarded-out Child, Demonstration of "Preventive Clinic." Some Problems of Infant Feeding, Dr. Maynard Ladd.

### PETER BENT BRIGHAM HOSPITAL

2 P. M. Diseases of the Large Intestine: Dr. John Homans. Controversial Points in regard to the Treatment of Gastric and Duodenal Ulcer: Dr. David Cheever.

### CHILDREN'S HOSPITAL

2.00-5.00 P. M. Surgical Operations: Empyema, hernia, harelip, cleft palate, webbed fingers, and other available cases to be announced at Hospital: Dr. James S. Stone and Staff.

2.00-4.30 *Orthopedic Clinic.* Dr. R. W. Lovett and Assistants.

2.00-2.15 Club Foot—Demonstration of Cases. Dr. Frank R. Ober.

2.15-2.30 Bed Treatment of Tuberculosis of the hip. Dr. Henry J. FitzSimmons.

2.30-2.40 Multiple Fibro-cystic Disease of Bone. Dr. Morton.

2.40-3.00 Results of Tendon Transplantation. Demonstration of Cases. Dr. A. T. Legg.

3.00-3.10 Operation for Posterior Drainage of the Hip Joint, Lantern Slides and Demonstration of Case. Dr. F. R. Ober.

3.10-3-30 Operation of Obstetrical, Paralysis—Cases. Dr. J. W. Sever.

3.30-3.45 Results of Reduction in Congenital Dislocation of the Hip—Demonstration of Cases. Dr. Robert Soutter.

3.45-4.00 Cases Illustrating Treatment ot Pott's Disease. Dr. R. W. Lovett.

4.00-4.08 Demonstration of a Light Portable Apparatus for Immediate Reduction of Fractures of the Extremities. Dr. Robert Soutter.

4.08-4.30 Lantern Slide Demonstration of Bone Disease. Dr. R. W. Lovett.

4.30-5.30 Throat Clinic, Laryngoscopy, Bronchoscopy, Oesophagoscopy, X-ray Demonstrations. Dr. D. Crosby Greene, Dr. Herman, Dr. Meserve.

5.30-6.00 Dental Clinic. Dr. Blumenthal.

### FORSYTH DENTAL INFIRMARY FOR CHILDREN

2 P. M. Research showing effects of vitamine deficient diet on teeth, bones, and joints. Exhibit of specimens, sections and photographs.

### INFANTS HOSPITAL

2.00-6.00 P. M. Exhibition of X-ray plates ot pulmonary tuberculosis. Influenza. Atelectasis with clinical and autopsy finding. Nursery technique. Milk Modification.

### INDUSTRIAL CLINIC

8 A. M. to 6 P. M. Lincoln Mutual Insurance Company, 210 Lincoln Street. Clinic for care of Industrial Injuries and Diseases. Damonstration of Equipment and Methods.

### PARKER HILL HOSPITAL, WEST ROXBURY HOSPITAL AND CHELSEA MARINE HOSPITAL.

### AT PARKER HILL HOSPITAL.

2 P. M. The Functional Element in Organic Nervous Diseases. Dr. H. Solomon. Case of Yaws, Dr. Sprague. Reconstruction Clinic. Operations 1,. F. J. Cotton and W. F. Cotting. Knee: damaged internal semilunar. Arthrotomy: Corner incision.

*Old Cases*: a. Gastroenterostomy. 1. Post-operative hemorrhage. 2. Vicious circle. b. Brain cyst—removal. c. Grafts. 1. Artificial thumb by graft. 2. For equinovarus. 3. For equinovarus. 4. For Arm Fracture. 5. For Arm Fracture. 6. For Arm Fraction. 7. For leg Fracture. 8. For leg fracture. 9. For leg fracture. 10. For leg fracture. d. Bone plastic, thigh lengthening (also aneurysm.) e. Bone plate by Cotting. f. Bone band by Cotting. g. Os calcis fracture: reduction. h. Old fracture scaphoid wrist, plastic excision. i. Arthroplastics for old g. s. w. 1. Elbow. 2. Elbow. j. Nerve sutures. 1 2 and 3 Cases. k. Tubercular tenosymivitis wrist op,—apparent cure. l. Knees—operative. 1. Osteochondritis. Op Mch. 7 before clinic. 2. Osteochondritis. 3. Osteochondritis. m. X-rays patella.

### MASSACHUSETTS GENERAL HOSPITAL. THROAT DEPARTMENT.

2-4 Amphitheatre Building D, Harvard Medical School Demonstration of Method of Radium Seed Implantation for Cancer of the Oesophagus. Dr. Greene. Demonstration on the Cadaver of Lachrymal Sac Operation. Dr. Mosher. Demonstration on the Cadaver of Operation for Malignant Tumors of the Accessory Sinuses. Dr. Barnes. Exhibition of Cases showing End Results of Operation and Radium Treatment in Nose and Throat Cases. Dr. Barnes and Dr. Greene.

### MASSACHUSETTS EYE AND EAR INFIRMARY THE. EAR DEPARTMENT

Oto-Laryngological Section.

4 P. M. Exhibition and Demonstration of Newer Instruments. Dr. C. A. Lothrop. Labyrinth Case. Dr. H. H. Vail. Labyrinth Case. Dr. D. E. S. Wishart. Thrombosis of the lateral Sinus Following Radical Mastoid Operations. Dr. A. C, Gibson. Exhibition of Temporal Bones, Room 101 Building D. Dr. C. B. Faunce ffl

### DIABETIC CLINIC

2-6 P. M. New England Deaconess Hospital: Dr. Joslin assisted by Dr. F. Gorham Brigham, Dr. Horace Gray, and Dr. Howard F. Root. Cases will be shown and demonstrations conducted illustrating: 1. Routine methods of treatment of diabetic patients. 2. Simplicity of the diabetic diet. 3. The harmful influence of High Fat Diets in Diabetes. 4. Pregnancy and diabetes. 5. Surgery and diabetes. 6. Diabetes in children. 7. Diabetic gangrene. 8. The Fridrichs test for quantitative estimation of acid poisoning. 9. Folin blood sugar test. 10. Microscopical specimens of the pancreas from four cases of diabetes—prepared by Professor F. B. Mallory.

### ANGEL MEMORIAL HOSPITAL FOR ANIMALS

Open all day for inspecition.

The meetings of the A. M. A. are of so much interest to the profession that the latest arrangements are published in full. This has made it necessary to hold in abeyance many matters of general interest.

## Miscellany.

### A REPORT TO THE MEDICAL PROFESSION BY THE MEDICAL ADVISORY COMMITTEE OF THE MASSACHUSETTS INDUSTRIAL ACCIDENT BOARD.

In view of unauthorized statements, not uncommon for some time, it seems opportune to state what has, more particularly what has not, been recommended by this committee as to the relation of doctors to the insurers under our industrial laws and to report this to a profession which seems not yet to know very exactly about the workings of the Massachusetts law.

1. No fee tables have been recommended.

2. Only average rates of compensation or rates "not excessive" have in any case been reduced to figures.

3. No recommendation has been made that rates higher than those so indicated should be barred in case they were justified by special conditions or reasons.

4. Nothing has been recommended to interfere with any contractual relations between doctors and insurance companies for taking care of cases within the legal time limit.

5. No recommendations have been made suggesting any rate of compensation or any interference with contracts made as to care of special cases outside the legal limit of time.

6. No ruling has been made or suggested that would interfere with any contract, expressed or implied, for the treatment of any person as a private patient.

7. In a case in which bill has been rendered

to a supposed private patient who proves afterwards to be entitled to compensation under insurance, in such cases no ruling has been suggested or made by us, or so far as we know anyone else, to force settlement on an Industrial rate basis. This point apparently is still open so far as any ruling goes. There is only a ruling that the insurer is not expected to be responsible for more than an industrial rate, i.e., a reasonable fee.

8. A ruling recommended to the Board in January, 1914, enacted into law in the same year, provides that unusual cases are to be cared for and proper charges for them paid by the insurer *beyond* the two weeks' limit. This was intended to prevent the possible neglect of serious cases. On the whole it has worked well. There is some haziness about the definition of an unusual case, but usually when a case is reported to the Accident Board within the two weeks a satisfactory arrangement is made.

9. *Hospital fees.*

There has been much feeling against the ruling that establishes a fixed weekly fee for hospitals that is sometimes below actual cost. The occasional hardship of this is conceded.

Unfortunately some uniformity in rulings is necessary.

Moreover, it is a fact that all public hospitals, and this includes most of our hospitals and those most often heard, are community hospitals of a more or less public type, and if chartered as charitable corporations, freed from taxes and certain legal disabilities in view of their supposed public services. This is true even if they are supported more by private than by public funds.

Therefore it is felt that the hardship of calling for treatment of the insured employee at the same rate as that charged his neighbor citizen involves less injustice than would result under other plans proposed.

Abuses as to non-payment of rates so prescribed, by insurance companies have at times heightened the bitter feeling. It is unfortunate that the Accident Board is not called on to enforce such claims. Unless a hearing is called for by the hospital the Board has no chance to act.

Beyond this matter of flat rates comes in that of special service,—private rooms, special nurses, etc. The standard set as to these matters is that charges for such service if really called for by the nature of the case are usually allowed;—if called for as luxuries they are to be charged to the recipient or those responsible, not the insurer.

10. *Fees to hospital physicians.*

There has been bitter feeling, often expressed, because of the ruling that, in effect, often forces staff hospital physicians to treat insured cases for nothing. This ruling, carefully considered, often discussed, before and since, is not the result of any bias against hospital physicians or in favor of insurance companies.

Here, too, the fact that public hospitals are exempted from various liabilities in view of public service rendered and that the doctor is in some measure compensated for his work by the experience and reputation gained is not without some pertinence.

It seems unwise to treat Mr. "X," injured in his own yard, and Mr. "Y," coming under compensation,—both lying in a given hospital ward,—on other than an equal basis. Mr. "X" pays his own bills. Mr. "Y"'s are paid by someone else—in this case the insurer—but the service of a community hospital to two citizens of like standing is the same.

In either case the physician is out of luck very often.

Some hospitals allow their staff to charge fees, some do not.

The rulings issued have only established a policy of equal treatment of average patients in a given hospital.

Also certain very ingenious subterfuges tending to throw insured patients into the private patient class have been and are to be discouraged.

It is not generally known that the profession, *as a whole*, is being pretty well paid for this work.

The amount paid to the medical profession ranged from $414,195 in 1912 to $1,602,057 in 1920, the total amount to the medical profession since the act became effective being $7,242,519.

The present cost of doctors and hospitals is more than the whole cost of the act in its first year, and any ruling that would materially increase this without notice would cause serious difficulty with insurance rates and might very probably bring about a broad standardizing of compensation that would be of no benefit to the doctor.

There are in this community many hospitals of many sorts with varying relations of doctor to hospital.

Any ruling must rest on an averaging of the conditions obtaining.

It is recognized that the rulings in force do not do full justice in the matter, and we should be glad to recommend better rulings.

Up to date, despite frequent—and recent—discussion no one of us (and several of us are losing our share of fees under the rulings)—no one of the seven of us feels that it would be wise at the moment to recommend a change.

11. *Specialists' fees.*

The principle that specialists' fees, in cases calling for specialists' services, shall be allowed for, at an industrial rate but at a higher rate than usual doctors' services, has been accepted and acknowledged by the Board.

12. Exceptional standing and repute of consultants—particularly if the consultant has been called in by the attending physician on account of such repute—may be considered as a basis of special charges, provided the nature of the

case justifies the employment of highly expert service. No actual ruling to this effect exists, however.

13. Recently complaint has been made that doctors' patients are sent for to be examined by insurance company doctors, dressings are taken down and ill-replaced, etc.

This is unfortunate, but the suggested alternative, having the patient's doctor always present, might not work perfectly.

If the doctor went along the expense would be very large in the aggregate—though perhaps not at all prohibitive, but would be at the expense of the injured man.

But,—and this interests us more—the doctor in many cases could not or would not go, and this would not only tend to deprive the insurance companies of a right of examination the law seems to mean them to have, but would deprive the patient, often enough, of valuable examination and advice.

It has been recommended that the patient be notified in detail on the notice requiring him to report for examination, of his rights under the present law, and the doctor himself communicated with if possible.

If this proves insufficient to correct any present abuse further action lies open.

The law reads:

During the first two weeks after the injury, and, if the employee is not immediately incapacitated thereby from earning full wages, then from the time of such incapacity, and in unusual cases, in the discretion of the board, for a longer period, the association shall furnish adequate and reasonable medical and hospital services, and medicines, when they are needed. The employee shall have the right to select a physician other than the one provided by the association, and in case he shall be treated by a physician of his own selection, or, where, in case of emergency or for other justifiable cause, a physician other than the one provided by the association is called in to treat the injured employee, the reasonable cost of his services shall be paid by the association, subject to the approval of the industrial accident board. Such approval shall be granted only if the board finds that the employee was so treated by such physician, or that there was such emergency or justifiable cause, and, in all cases, that the services were adequate and reasonable and the charges reasonable. In any case where the board is of opinion that the fitting of the employee with an artificial eye or limb, or other mechanical appliance will promote his restoration to industry, it may order that he be provided with such an artificial eye, limb, or appliance, at the expense of the insurer.

Perhaps a word of history as to the relation of the profession to the administration of the law may not be amiss.

In 1912 the Industrial Accident law of Massachusetts became operative. It was passed as a piece of purely social legislation on which the doctors had not been consulted,—in regard to which the profession had taken no stand and shown no interest.

Very promptly though it became evident that the doctors were vitally interested; and thought they were being "done",—as they were.

Under the original law the insurer had all the rights, the doctors none at all, for at that time the free choice of the physician,—since legalized as a result of pressure by the profession, did not exist and under the law the insurer need not pay bills for services he had not authorized.

The profession was hostile—the board a bit pained and perhaps a bit bewildered.

The matter focussed in remarks by one of us at a meeting of the Society of Examining Physicians which led to a prompt request by Mr. Justice Jas. B. Carroll, of the Supreme Judicial Court, the first chairman of the Board, for Medical Advisors.

Public hearings were held, not without heat and entertainment, and the board presently called in the Medical Societies for nominees and appointed the following committee to help:

F. J. Cotton, Boston, Chairman; F. W. Anthony, Haverhill; representing the Mass. Medical Soc'y. S. H. Calderwood, Roxbury, Secretary; S. E. Fletcher, Chicopee; representing the Homeopathic Medical Soc'y. Francis D. Donoghue, Boston; Dr. W. P. Bowers, Clinton; Dr. C. E. Mongan, Somerville; Dr. L. F. Woodward, Worcester;*Wm. H. Ruddick, South Boston; *Frank E. Allard, Boston; representing the Board.

Be it understood that this committee had not and has not any legal existence but is an advisory committee to the Board.

For the first year or two a large part of the work (and it was heavy work, with frequent meetings) lay in the adjustment of disputed bills—in stacks.

An attempt was made to establish principles, with some success, and it was early recognized that the Board should have its own physician to deal with daily detail.

The place was presently created and Dr. Francis D. Donoghue appointed to the position he has since then filled so efficiently.

Dr. W. P. Bowers stepped into his place on our committee.

Of recent years the committee has only been called on by the board to advise in special matters or has met to consider questions referred to it from the profession for its consideration and for such suggestions to the Board as have seemed advisable.

It is to be remembered that the Industrial Accident Board is responsible not for the law but for its administration, under rulings of the courts, perhaps not always quite welcome. Like the courts they are called on to rule only on cases brought before them, not on matters of abstract equity.

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* Died.

The Medical Advisory Committee has no legal status.

It acts only to represent the profession as best it may and to help the Board.

The Board regard the law quite rightly as a Workmen's law and not primarily as a doctor's affair, but we have found them open-minded and fair, with a real regard for the profession, and willing to do for us all that they feel they may do within the limitations of their office and the law under which they work.

The following decision by the board in the case of Joseph Veniski v. Southbridge Printing Co., Employers' Liability Assurance Corp., Ltd., insurer, covers comprehensively the attitude of the board in regard to the question of unusual cases under Part II, s. 5, which is the medical provision of the act:

The Board finds and rules upon all the evidence, that this is an unusual case under Part II, s. 5, of the Act. The Board finds that the injury of February 21, 1918, resulted from a burn of the right arm extending from the wrist to above the elbow; that as a result, the forearm was badly burned and sloughing, and all the tendons of the flexor surface of the forearm were destroyed; that fifty small grafts were taken from the thigh at one time and later sixty other grafts were taken, all of them being grafted upon the forearm. The Board finds that the hospital services, including nursing and other care, and the medical and surgical treatment were adequate and reasonable and were made necessary by reason of the injury of February 21, 1918. The bills of the physician, W. G. Read, M.D., in amount $22, and St. Vincent's Hospital, in amount $303.16, are reasonable and are approved for payment by the insurer.

As to the contentions raised by the insurer in this case:

The Court has said, in Panasuk's Case, 217 Mass. 589, that "the collocation of section five and its subject matter show plainly that its benefits are a part of the compensation to which the workman is entitled."

The amendment providing for the payment of medical and hospital services and medicines in "unusual cases" was the result of the following recommendation of the Board, which is taken from the First Annual Report of the Industrial Accident Board, Public Document No. 105, published January, 1914, p. 51.

"The Industrial Accident Board requests that the Legislature give the Board the power to require the payment of bills for medical and surgical treatment, medicine, medical and surgical supplies, crutches and apparatus when necessary, beyond the first two weeks after the injury, in unusual cases where the injury is so serious as to require and warrant such additional medical treatment."

As a result of this recommendation, St. 1911, ch. 751, P. II, s. 5, which read:—"During the first two weeks after the injury, the association shall furnish reasonable medical and hospital services, and medicines when they are needed"—was amended by St. 1914, ch. 708, s. 1 to read as follows:

"During the first two weeks after the injury, and if the employee is not immediately incapacitated thereby from earning full wages, then from the time of such incapacity, and in unusual cases, in the discretion of the Board, for a longer period, the association shall furnish reasonable medical and hospital services, and medicines, when they are needed. Where, in a case of emergency, or for other justifiable cause, a physician other than the one provided by the association is called in to treat the injured employee, the reasonable cost of his services shall be paid by the association, subject to the approval of the Industrial Accident Board. Such approval shall be granted only if the Board finds that there was such justifiable cause and that the charge for the services is reasonable."

While the amendment does not carry the explanatory statement which is found in the Board's recommendation—"where the injury is so serious as to require and warrant such additional medical treatment"—this Board, for the past six years, has given great weight to the nature of the injury as such in exercising their discretion in the matter of approving bills for medical and hospital services beyond the first two weeks after the injury; and it is fair to assume that in the absence of qualifying language, the word "unusual" is to be given its ordinary, lexical meaning and is not to be restricted by circumstances or conditions having nothing to do with an employee's rights under the Act, such as his marital status, his standard of living, or other personal circumstances or conditions.

The word "unusual" is defined as follows:

"Of a character, number or size not usually met with; uncommon; infrequent; rare." (Standard Dictionary of the English Language, Funk & Wagnalls.)

"Not usual; uncommon; rare." (Webster's Dictionary.)

"Not usual; not frequent; not common; rare; strange." (Century Dictionary.)

The evidence shows that this case is unusual; that it is a case out of the common run of cases, in view of the nature of the injury and the results flowing from such injury. The usual case and the usual personal injury arising out of the employment are those cases and injuries which require ordinary medical treatment and care, and which go along uneventfully to their termination; and they may or may not require treatment for a longer period than two weeks. These cases are not within the discretion of the Board to allow further medical and hospital fees after the first two weeks. A case may be unusual because the nature of the injury, its particular location and its extensiveness necessarily entail a prolonged disability; that is, longer than the usual. It may be unusual because of any interruption of convalescence of such a nature as not to occur commonly in that particular class of cases, and because it is likely, unless specially treated, to jeopardize the probability of a speedy recovery from a medical standpoint and the employee's early restoration to his position as a wage-earner.

Under the usual classification will come so-called minor injuries, minor amputations, uncomplicated by sepsis, and all injuries of a minor type which do not require, as a result of such injuries or complications following them, the services of specialists, special nursing, or hospital care. Under the unusual case classification may come major injuries, compound fractures, serious burns, injuries followed by sepsis, major amputations and operations, serious pelvic and back injuries, and injuries requiring special apparatus or the services of specialists.

Compensation under the Act and an employee's rights under the medical section (Part II, s. 5) which are a part of the compensation to which he is entitled, when injured, are due the employee solely upon the happening of certain contingencies, and without regard to his condition of wealth or poverty, to wit: A personal injury arising out of and in the course of his employment by an insured employer, and whether his is an unusual case which will entitle him to medical and hospital services after the first two weeks.

If the insurer is right, the fact that the employee's injury arose out of and in the course of his employment, and his injury is an unusual one, is controlled by other conditions and circumstances; he loses his right to receive necessary hospital and medical treatment at the expense of the insurer, if he is unmarried, his standard of living is low, or by reason of other economic conditions; and all such cases at the end of two weeks from the date of the injury must be turned out of the hospitals unless the employee himself will guarantee the charges. If such an interpretation is to be given effect as the law governing the rights of employees having unusually serious and dangerous injuries, it will have the result of causing employees to forego necessary medical treatment, to their own physical detriment and to the added cost of insurance under the Act, or it will cause employees to seek necessary surgical and nursing attendance at home, at a greatly increased expense to the insurer, for by the simple expedient of remaining at home the employee may secure at the expense of the insurer, in unusual cases, such medical, surgical and nursing services as he may need.

In this case, had the employee elected to receive necessary medical, surgical and nursing attendance at his home, the cost to the insurer would be several times in excess of the charge made by the hospital. The employee required the care of a skilful nurse and received, without charge, operative treatment from a surgeon, W. F. Lynch, because of his membership on the staff of the hospital. The Board regularly approves bills of nurses at the weekly rate of $28, and this sum for a period of 29 5-7 weeks covered by the bill of the hospital, would amount to $832; and if a charge were made by the staff surgeon, as the private physician of the employee, such charge would be at least $100, on the basis of an allowance of $50 for each of two extensive skin grafting operations.

As to the argument that an employee whose right hand had been rendered permanently incapable of use by reason of conditions due to the injury, should expend his compensation for the purpose of providing necessary hospital, medical and nursing care, the Board believes that in view of the very serious nature of his injury and the permanent results flowing therefrom, they are warranted to the exercise of a wise discretion under Part II, s. 5, in finding this to be an unusual case in which the reasonable cost of necessary hospital, medical and nursing care should be paid by the insurer in the sums named in the first paragraph of this finding. (Veniski's Case.)

## NOTICES.

MEDICAL VETERANS OF THE WORLD WAR.—There will be a meeting of the Association of the Medical Veterans of the World War on the day preceding the meeting of the scientific sections of the American Medical Association, the time and place to be announced later. Col. V. C. Vaughan is president of the Association, and Col. F. F. Russell, U.S.A., secretary. All medical officers, contract surgeons of the U. S. Army, and acting assistant surgeons in the United States Public Health Service, who have served in the Medical Corps of the United States Army, United States Navy and United States Public Health Service, and all members of medical examiners of local, medical advisory and district boards, officially appointed by the President of the United States, the Provost Marshall General of the United States Army, and the Governors of the various states are eligible to membership in this organization. The object of this Association "is to perpetuate fellowship, to prepare history, secure coöperation for the mutual benefit of the medical men who served in the World War, 1914-1918, and for the mutual improvement and social intercourse of its members."

MCGILL GRADUATE SOCIETY of New England will hold their dinner at the Boston Art Club, Wednesday evening, June 8. All McGill graduates attending the A. M. A. Congress will be welcome.

BIGELOW MEDAL ADDRESS.—Dr. William J. Mayo will give an address entitled "In the Time of Henry Jacob Bigelow," on Monday, June 6, 1921, at half past eight o'clock, Jordan Hall, Huntington Avenue and Gainsboro Street, Boston. On this occasion will be made the first award of the Henry Jacob Bigelow medal. Ladies are invited to attend. Tickets of admission may be secured by addressing Dr. Walter C. Howe, Secretary Boston Surgical Society, 303 Beacon St., Boston, Mass.

## RECENT DEATH.

DR. JAMES FRANCIS BRADY, dermatologist to the Carney Hospital, died at the home of his brother in West Newton, May 2, 1921, aged 48. He was born in Nova Scotia, April 2, 1873, and was graduated from Harvard Medical School in 1901. He was a Fellow of the Massachusetts Medical Society.

The Boston Medical and Surgical Journal

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# The Massachusetts Medical Society

## SHATTUCK LECTURE.*

## THE PREVENTION OF HEART DISEASE—A NEW PRACTICAL PROBLEM.

BY HAVEN EMERSON, A.M., M.D., NEW YORK.

IT is said, with much truth of us as physicians, that we know more facts than we use, that it is not knowledge but the application of it that is desired of us. Even at the risk of entering the lists of the propagandists and promoters, of abandoning the fruitful and tempting paths of scientific study for the sake of exploiting well known facts, I venture to distract you for the brief period of our meeting, from your devotion to treatment of the individual, and to encourage your ever increasing interest in a phase of preventive medicine which seems to me to offer a new field of triumph to our profession.

Theodore Janeway, in the Shattuck Lecture of 1916, said: "The need of the moment, therefore, is for more knowledge; not more knowledge of the dangers of circulatory diseases for the public, which means propaganda, but more knowledge of their causes for the physician, which means ceaseless investigation." And so the need of the moment was, and still the need exists, and always will, and yet there is so much known of causes of deaths that might have been postponed, of sickness that should have been abbreviated, of resources for salvage of the handicapped, that we can no more await the complete array of facts before mobilizing our resources than we could justify withholding vaccination until the etiology of smallpox is established. So, while the strongest call to the physician will, and always should, be to ferret out the causes of disease and ever extend the realm of preventable disorders, and while the voice of such rare and precious students and teachers as Theodore Janeway still calls clearly and true to the clinician, the physiologist, the pathologist, to combine in their assaults upon our own ignorance and nature's secrets, may there be heard also the plea for those whose lives are jeopardized because of lack of industry in the use of the tools of our trade already sharpened and at hand.

In speaking of cardiac disease, let me, for convenience, include the four titles of the international list of causes of death: angina pectoris, pericarditis, acute endocarditis, and organic heart disease, which, in spite of minor errors, have been used with fair consistency for many

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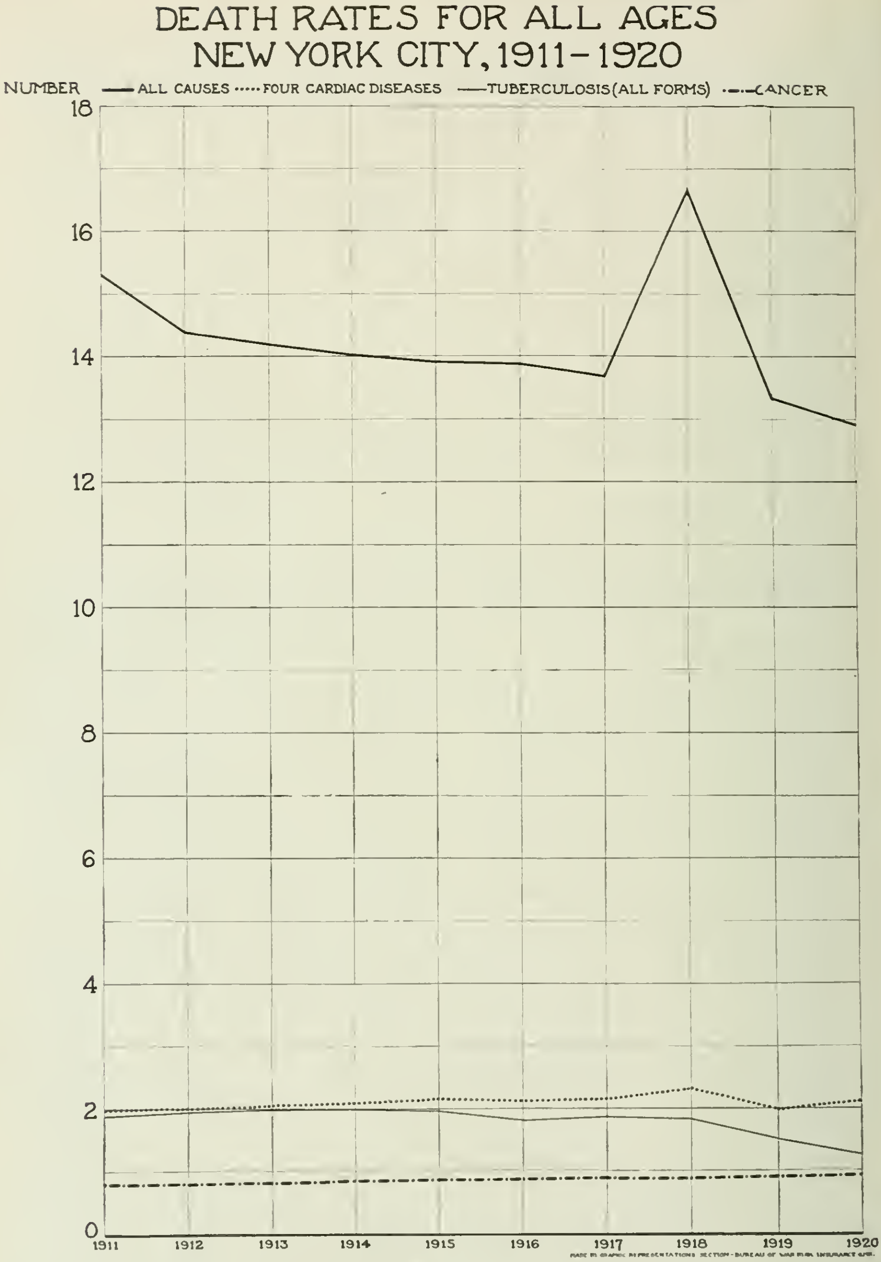
* Presented at the Annual Meeting of the Massachusetts Medical Society, Boston, May 31, 1921.



MADE BY GRAPHIC REPRESENTATIONS SECTION - BUREAU OF WAR RISK INSURANCE APR.

CHART A.

years, and with such uniformity as the shifting fashion of clinical nomenclature permits.

My objective will be to persuade you that it is within the realm of possibility, within the reach of present day medical and social knowledge and resources to make as much reduction in sickness and premature death from heart disease as has been obtained by teaching, by diagnosis, by organized medical services in the control of tuberculosis. We have seen first one and then another of the national volunteer efforts in preventive medicine abandon the exclusive methods and arguments of the fanatic, the dramatic appeals of the hobbyist, and arrive at a stable program of endeavor which accepts and includes the facts that disease control depends on a general elevation of the health of all people, and that no age, sex, occupation or race group can long maintain an advanced position of healthfulness without the interest and assistance of all the rest.

The tuberculosis campaigners first recognized that their own special problem could best be helped by their engaging in attack upon all sickness. The devotees of the unborn babe, of the school child, of the blind, and latterly the banded hosts attacking venereal disease and mental disorders, have all come to see the unity of their interest in, and dependency upon, the general health level of mankind and his environment, whether in home, shop, or field.

The infant, the almost embryonic effort at control of our greatest single group of causes of death, at the very start finds its success or failure inextricably bound up with those various preventable diseases of infection, of occupation, of habit, of inheritance, which play a dominant part in the lives and hazards of each age group. In one sense, then, we cannot escape the conclusion that the chief excuse for singling out heart diseases as worthy of selected attack is that we can, perhaps, in this way obtain attention and consideration for a large group of the unnecessarily handicapped, and rouse a determination to put an end to recruiting among the healthy childhood of the nation for the invalids of middle age.

Following the methods of the epidemiologist, let us outline the bulk and location of our disease group. Without going into ponderous details, one can see at a glance the uniform and practically universal preëminence of the heart diseases as a cause of death.

While, up to ten years ago, tuberculosis kept pace with organic heart disease for first place among the causes of death, recently the steady decrease in deaths from all forms of tuberculosis has left heart disease in a position of single eminence. Deaths from the four heart diseases, in New York City, during the past ten years, have been at no time less than 200 per annum per 100,000 of population, and since 1915, all forms of tuberculosis have caused less than 200 deaths annually per 100,000 population, and in 1920 caused not more than 126 per 100,000.

On Chart "A" are shown the crude death rate per 1,000 of population, the death rates for the four cardiac diseases, for all forms of tuberculosis, and for cancer, in New York City, for the years 1911 to 1920.

The following table gives the figures from which the chart was drawn:

| Death Rate Per 1,000 of Population | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 |
|---|---|---|---|---|---|---|---|---|---|---|
| All Causes | 15.30 | 14.41 | 14.21 | 14.03 | 13.93 | 13.89 | 13.70 | 16.71 | 13.35 | 12.93 |
| Four Cardiac Diseases | 2. | 2.01 | 2.07 | 2.11 | 2.17 | 2.13 | 2.17 | 2.32 | 2.00 | 2.13 |
| Tuberculosis, all forms | 1.83 | 1.96 | 1.99 | 2.00 | 1.96 | 1.82 | 1.88 | 1.84 | 1.52 | 1.28 |
| Cancer | .79 | .82 | .83 | .87 | .88 | .88 | .90 | .89 | .92 | .93 |

In the state of Massachusetts, with an estimated population of 3,827,329, as of July 1, 1919, there were 7,596 deaths from the four cardiac diseases during the year, or a rate of 198.4 per 100,000; the rates for these diseases separately being, for pericarditis, .7; acute endocarditis, 7.; angina pectoris, 9.7; and for organic heart disease, 181. per 100,000 of the population.

When we study the distribution of these deaths throughout the year, we find a curve of incidence not very different from that of the respiratory group of diseases. (Chart "B"). The heavy loss of life from cardiac diseases occurs in the months of October to May, and when respiratory disease is prevalent, of whatever nature, the deaths from cardiac diseases rise at once. The uniform distribution of cancer is shown in comparison with the seasonal variations of pulmonary tuberculosis and organic heart disease in the experience of New York City for the years 1914-19.

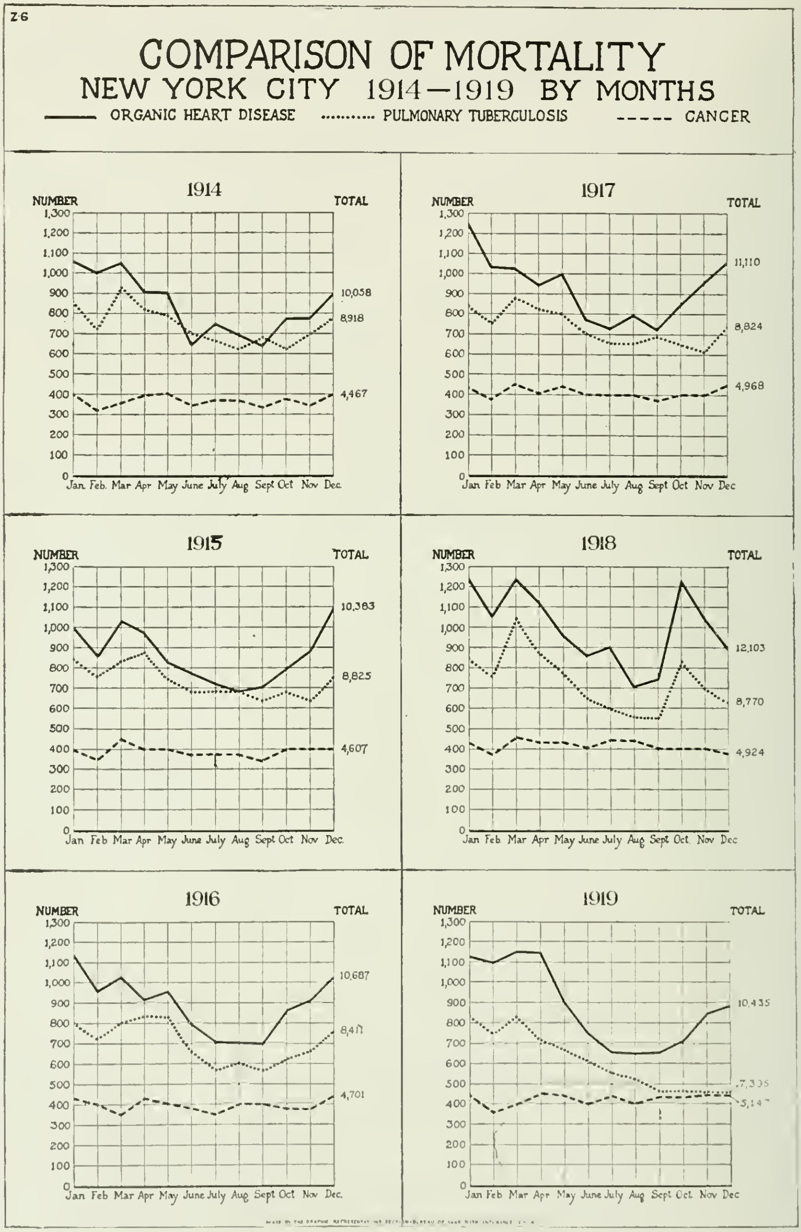

Z-6
COMPARISON OF MORTALITY
NEW YORK CITY 1914—1919 BY MONTHS
ORGANIC HEART DISEASE
PULMONARY TUBERCULOSIS
CANCER
NUMBER
TOTAL
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1914
10,058
8,918
4,467
1917
11,110
8,824
4,968
1915
10,383
8,825
4,607
1918
12,103
8,770
4,924
1916
10,687
8,411
4,701
1919
10,435
7,335
5,147

Chart B.

That this is not merely an urban phenomenon can be seen from Chart "C," which shows the assembled experience of the same six years in the rural population of the registration states of the United States, representing an experience of 261,609 deaths from cardiac disease in a population rising from 30,520,275 in 1914.

The table from which the Chart "C" was drawn follows:

Number of deaths from organic diseases of the heart, by month of death, 1914 to 1919, in the rural part of the registation states as constituted in 1914.

| Year |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Number of deaths from organic diseases of the heart. |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Total* | Jan-uery | Feb-ruary | March | April | May | June | July | Aug-ust | Sept-ember | Oct-ober | Nov-ember | Dec-ember |
| Rural part of Registration States as of 1914* |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1914 | 40,728 | 3,959 | 3,537 | 4,140 | 3,807 | 3,528 | 3,044 | 2,945 | 2,880 | 2,915 | 3,062 | 3,225 | 3,706 |
| 1915 | 42,755 | 3,984 | 3.824 | 4,480 | 4,152 | 3,556 | 3,144 | 3,175 | 3,039 | 3,025 | 3,264 | 3,271 | 4,061 |
| 1916 | 44,645 | 4,854 | 4,118 | 4,301 | 3,807 | 3,764 | 3,422 | 3,278 | 3,033 | 3,098 | 3,283 | 3,571 | 4,120 |
| 1917 | 46,354 | 4,886 | 4,375 | 4,416 | 4,093 | 4,088 | 3,642 | 3,369 | 3,094 | 3,208 | 3,603 | 3,530 | 4,093 |
| 1918 | 46,388 | 4,328 | 4.017 | 4,309 | 4,258 | 3,826 | 3,377 | 3,291 | 3,100 | 3,259 | 4,539 | 3,778 | 4,308 |
| 1919 | 40,741 | 4,251 | 3,601 | 4,058 | 3,755 | 3,599 | 3,010 | 2,982 | 2,843 | 2,674 | 2,942 | 3,323 | 3,703 |
| Totals |  |  |  |  |  |  |  |  |  |  |  |  |  |

*Exclusive of North Carolina, which included only municipalities having a population of 1,000 or more, but less than 10,000, in 1910.

NOTE: "The "rural part of registration states" embraces the area outside of municipalities of 10,000 population or more in 1910. The estimated midyear population, 1914, of the rural part of registration states* as of 1914 is 30,530,275, based on the Federal censuses of 1900 and 1910.

The same regular seasonal variation appears and the similarity of the curve of 1914 to that of the combined six years is striking:

The year 1918 is shown to illustrate the two peaks of high death incidence caused in the rural areas of the United States registration area, as in the urban population of New York City, by the 1918 epidemic of influenza. Chart "D" records the same facts as Chart "C," but by the methods of ratios instead of by the method of differences.

A still further evidence of the similarity of cardiac disease death rates among all groups of population is found in the experience in New York City and State, for example, in 1920. Here the death rate per 1,000 of the population from organic heart disease, acute endocarditis and angina pectoris combined in New York City (population, 5,665,148) was 2.13; in the state, exclusive of New York City, (population, 4,785,586) was 2.40; and in the rural population of New York State (population, 2,258,717) was 2.50, an increase which could only be adequately explained by an analysis of the age groups of these three populations.

Analysis of cardiac deaths by age groups shows their relation to deaths from all causes. (Chart "E.") Here the death rate at the several age groups per 1,000 living in the group, is indicated as rising gently from early infancy until the age group 35-45, when the rate rises rapidly.

While the death rate from cardiac diseases in the age group 25-30 represents 9.1% of all deaths at this age group, the cardiac disease deaths at the age group 35-45 are 13% of all deaths at this age group, and cardiac deaths at the age group 55-65 are 23% of all deaths at this age group.

The figures from which Chart "E" was drawn are given in the following table:

Rates for 1000 populatiou at age groups.

|  | Under 5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-45 | 45-55 | 55-65 | 65+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Causes | 31.8 | 3.5 | 2. | 3. | 4.5 | 5.6 | 7.7 | 11.6 | 22.3 | 44.8 | 103.4 |
| Four Cardiac Diseases | .14 | .33 | .41 | .39 | .38 | .51 | .79 | 1.47 | 3.91 | 10.09 | 30.10 |

On further splitting up our problem into its smaller elements, it will be seen by a study of Chart "F" that pericarditis, angina pectoris, and acute endocarditis play a relatively insignificant part in the total deaths from cardiac diseases at whatever age group. Distributing the deaths from the four cardiac diseases for the ten years 1911-20 in New York City by 18 age groups, we get a picture from which we can draw valuable lessons for a preventive campaign. Whatever measures we may find suitable to apply will certainly have to bear largely upon the age groups under 15.

This chart shows the actual differences in numbers of deaths at each age group, and in this method of graphic representation much is lost which can be shown best by using the semilogarithmic method, or the chart of ratios (Chart "G").

Here the same facts are recorded as appear

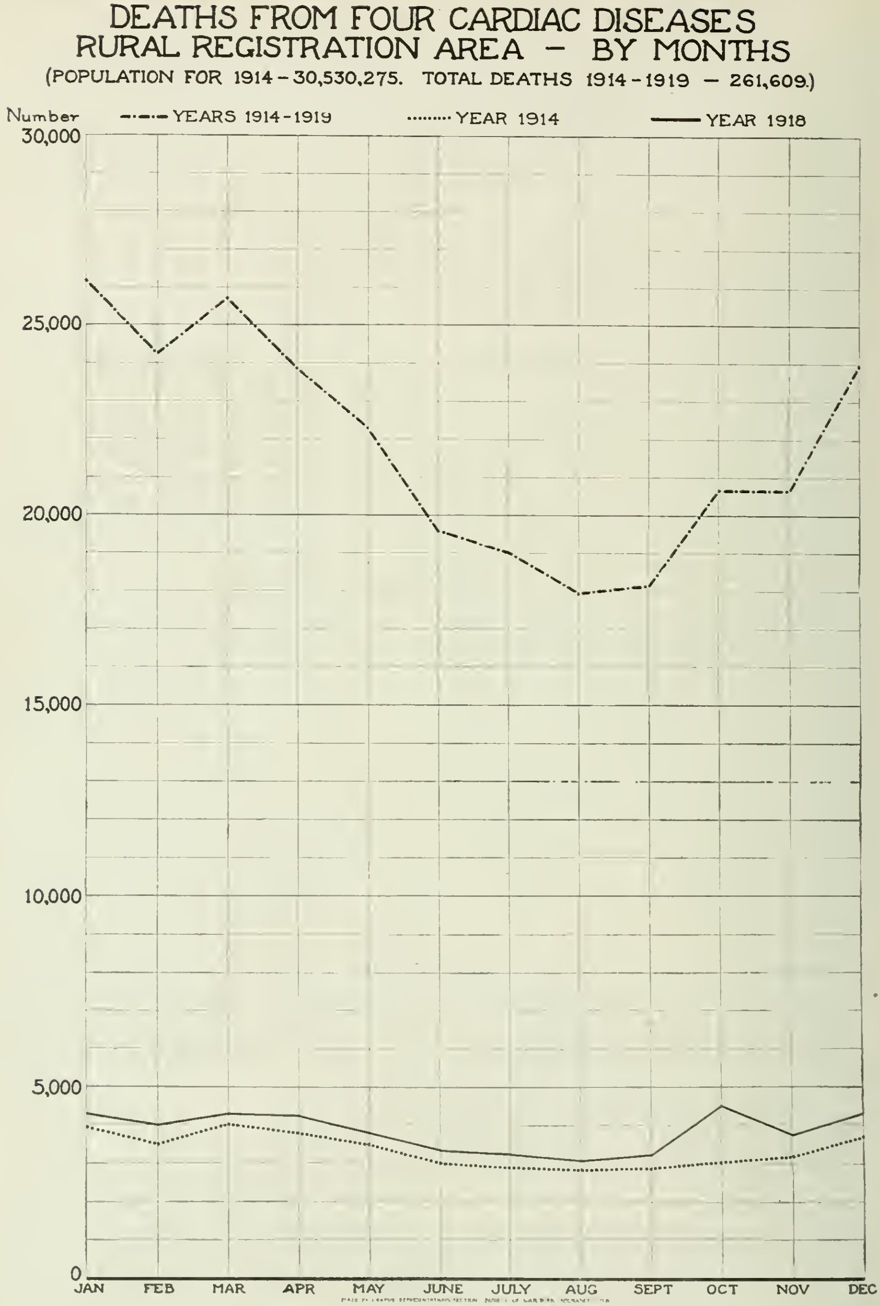

DEATHS FROM FOUR CARDIAC DISEASES
RURAL REGISTRATION AREA – BY MONTHS
(POPULATION FOR 1914 – 30,530,275. TOTAL DEATHS 1914 - 1919 – 261,609.)
Number
YEARS 1914-1919
YEAR 1914
YEAR 1918
30,000
25,000
20,000
15,000
10,000
5,000
0
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

Chart C.

on Chart "F," but the per cent. of increase from one death to 10 has the same value in the curves as the per cent. of increase from 10 deaths to 100, or from 1,000 to 10,000. By this method one can exhibit on the same chart the differences of age group distribution of deaths from cardiac disease, such as angina pectoris, with not more than 400 deaths at any one age group, and deaths from organic heart disease with 13,000 at the same age group. If we plot statistical curves of widely different magnitudes on the same drawing, and if our object is to compare not only the amounts of increase or decrease, but the percentage rates of change, there is only one correct method: the semi-logarithmic chart.

The almost uniform number of deaths from acute endocarditis at each age group up to 55, and then the sharp drop, and the quite similar curve of pericarditis deaths contrast sharply with the sky-rocket curve of angina pectoris in the age groups over 15 years, and the more gradually mounting curve of organic heart disease to the age group 60-65.

The significance of the variation in deaths at the several age groups would be largely lost if we relied only upon the chart of differences (Chart "F"), instead of using the method of ratios, as shown in Chart "G."

To quote from a brief statistical survey of the importance of cardiac deaths, by Louis I. Dublin:—

"Under 25 years of age, organic heart disease causes as many deaths as typhoid fever;

"Between 25 and 34 years, organic heart disease causes as many deaths as lobar pneumonia;

"Between 35 and 44 years, organic heart disease causes more deaths than Bright's disease;

"After 45 years, organic heart disease shows a higher death rate than any other cause."

Of the amount disbursed in death claims by the Metropolitan Life Insurance Company in 1920, over $5,000,000 were paid on account of deaths from organic heart diseases. To quote further from the same statistical bulletin of the company (February, 1921), with regard to loss in expectation of life on account of organic heart diseases, we learn that there is a curtailment of two years of life expectation among females, and one and two-thirds years among males, this loss being heavier among white people than among colored. This loss in life expectation is greatest about the age of five and continuous up to and beyond the age of 75, as can be seen from the accompanying table:

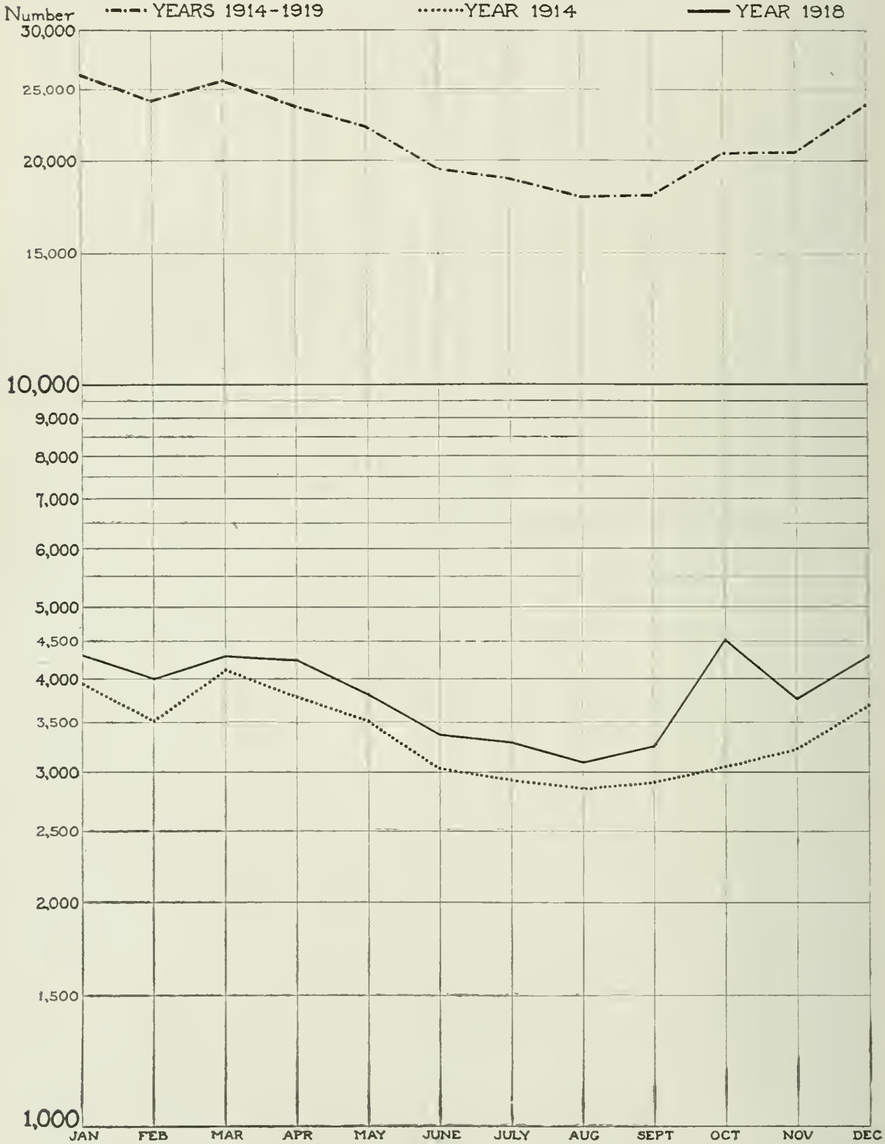
| | WHITE | | COLORED | |
|---|---|---|---|---|
| Age | Male | Female | Male | Female |
| 0 | 1.67 | 1.98 | 1.57 | 1.87 |
| 1 | 1.86 | 2.17 | 1.87 | 2.18 |
| 2 | 1.91 | 2.21 | 1.97 | 2.29 |
| 3 | 1.94 | 2.24 | 2.01 | 2.33 |
| 4 | 1.95 | 2.26 | 2.03 | 2.35 |
| 5 | 1.95 | 2.27 | 2.03 | 2.37 |
| 15 | 1.93 | 2.25 | 2.08 | 2.43 |
| 25 | 1.89 | 2.23 | 2.15 | 2.54 |
| 35 | 1.88 | 2.19 | 2.23 | 2.60 |
| 45 | 1.87 | 2.12 | 2.17 | 2.44 |
| 55 | 1.81 | 1.99 | 1.95 | 2.11 |
| 65 | 1.56 | 1.68 | 1.62 | 1.68 |
| 75 | 1.19 | 1.21 | 1.27 | 1.23 |
| 85 | .96 | .82 | .99 | .85 |
| 95 | .41 | .42 | .33 | .38 |

Whether or not cardiac diseases are increasing as causes of death, need not concern us here, and it is, to say the least, doubtful whether any valid thesis to this effect can be maintained in view of the lack of uniform methods of diagnosis and certification of death from generation to generation. It would appear that the last twenty years have developed an increase in death rates from cardiac diseases, especially at the older age groups, but the elements of error are too great for us to accept any such statements as final.

We are in the same dilemma in our study of heart disease as we are in most other matters of disease prevalence, since deaths and death rates bear about as much relation to the problem of the suffering human as the ash dump does to the life of the industrial plant. We have no adequate morbidity data of any disease, and the methods of survey of hospital, dispensary, or private practice experience leave much to be desired. Although we can estimate with considerable accuracy the true incidence of typhoid fever, from deaths occurring from this disease, we have no ratio of percentage based on any recorded experience to indicate how many people in a community are in all probability suffering from heart diseases when we have recorded the deaths. We have certain broad experiences, however, that approximate the truth probably as nearly as we can in tuberculosis.

About 5% of the men called in the drafts were rejected because of disabling heart disease. About 2% of the food handlers in New York City were found to have clinically important heart disease. About 2% of life insurance applicants are rejected because of cardiac disease. About 2% of the children in school populations are found to have some cardiac disorder.

DEATHS FROM FOUR CARDIAC DISEASES
RURAL REGISTRATION AREA BY MONTHS
(POPULATION FOR 1914-30,530,275. TOTAL DEATHS 1914-1918-261,609.)



MADE BY GRAPHIC REPRESENTATIONS SECTION — BUREAU OF WAR RISK INSURANCE — C.H.K.

Chart D.

Further study of the latter experience, the only one of the four so far followed through by systematic medical and nursing supervision, shows that probably not more than one-half of those with signs of cardiac abnormality of sound or function are suffering from disorder of such nature as to require medical care and direction. Taking the community as a whole, we may be within the truth if we estimate that not more than 2% and not less than 1% of the total population at any time need care and medical assistance because of heart disease.

The percentage of children in public and parochial schools of New York City found to have cardiac diseases among those examined by medical inspectors of the Department of Health, is shown in the following table:

| | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 |
|---|---|---|---|---|---|---|
| Number of Children Examined | 278,174 | 276,611 | 328,190 | 247,735 | 248,978 | 243,418 |
| Number with Cardiac Diseases | 1.5 | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 |

In sickness surveys made by the Metropolitan Life Insurance Company, which included the experience among 571,757 persons, organic diseases of the heart were exceeded only by external violence, rheumatism, influenza, pneumonia, tuberculosis, diseases of the stomach, and apoplexy as disabling sicknesses.

A gradual increase in the incidence of cardiac diseases and chorea among 356,292 school children during their school years, as found by examinations by the medical inspectors of the New York City Department of Health, has been reported by Dr. S. Josephine Baker, both boys and girls showing about twice as high an incidence of both these groups of disorders at ages 14 and over, as they are found to have at the age of eight.

To follow the method of presentation so effective in attracting the attention of laymen to the seriousness of the tuberculosis problem, we may say with reasonable accuracy that cardiac diseases are responsible for one in every six or seven deaths (tuberculosis is responsible for one in every ten deaths). More than one per cent. of the entire population is suffering from some form of organic heart disease (one per cent. has active pulmonary tuberculosis).

There are from five to nine cases of heart disease for every cardiac death per annum (there are probably nine to ten known active cases of pulmonary tuberculosis for every death from this disease per annum).

It will be accepted, therefore, that the detection of cases of cardiac diseases in their incipiency is important to the community for the prevention and postponement of disability and death. As in the wise plan for the control of tuberculosis, periodic medical examinations, especially trained consultants to counsel with the general practitioner, and medical supervision of school children and industrial workers have been found effective, so we may expect similar benefit by the same methods in an attack upon heart disease.

There is lacking any clinical or pathological information upon which could be based even a presumptive curve of the incidence of cardiac diseases by age groups.

The ages at which the communicable diseases chiefly occur, which we believe are responsible for the majority of cases of valvular and muscular diseases of the heart, certainly fall in the age groups under 35, and a majority before the age of 10, and perhaps, the largest number for any one age group before the age of 5.

In support of this very general statement, permit me to report upon the experience of some of the special cardiac clinics of the Associated Cardiac Clinics in New York City. A total of 6808 patients are reported upon, of whom 4392 were active cases on May 1, 1921; that is, were in regular attendance or under supervision of the visiting nurse of the clinic.

Among the adults of this group, the histories of 927 appear to have been so carefully analyzed as to permit of a sound opinion as to the probable causative infection, as follows:

| | |
|---|---|
| In 331 cases, | acute rheumatic fever |
| 207 | acute tonsillitis |
| 122 | syphilis |
| 78 | scarlet fever |
| 47 | diphtheria |
| 14 | pertussis |
| 54 | measles |
| 163 | carious teeth |
| 7 | chorea |
| 927 | |

Of these patients, 614 were active cases in regular contact with the clinics on May first.

In attempting to obtain similar facts from the histories of the children attending special cardiac clinics, the problem is more difficult, be-

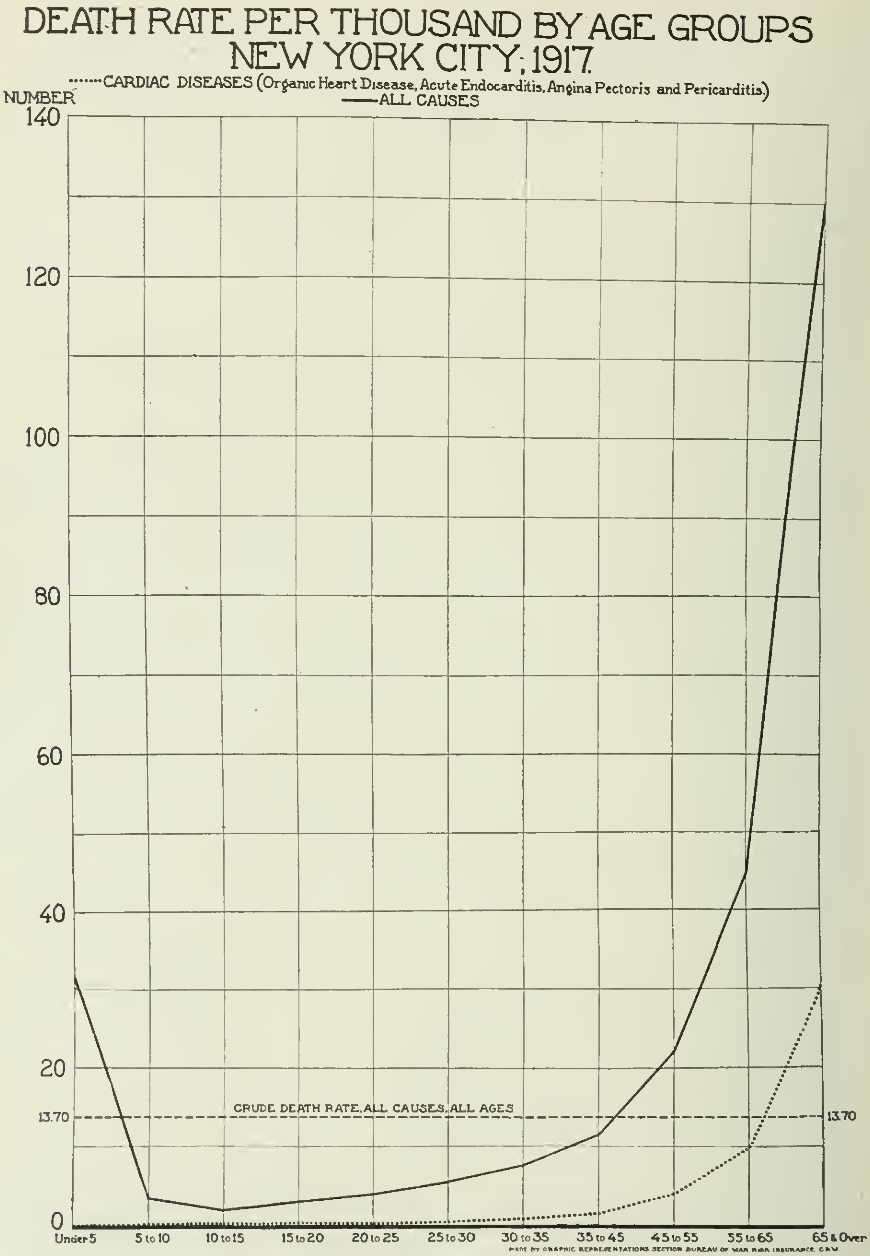

DEATH RATE PER THOUSAND BY AGE GROUPS
NEW YORK CITY; 1917.
······CARDIAC DISEASES (Organic Heart Disease, Acute Endocarditis, Angina Pectoris and Pericarditis.)
——ALL CAUSES
NUMBER
140
120
100
80
60
40
20
13.70
0
CRUDE DEATH RATE, ALL CAUSES, ALL AGES
13.70
Under 5
5 to 10
10 to 15
15 to 20
20 to 25
25 to 30
30 to 35
35 to 45
45 to 55
55 to 65
65 & Over
MADE BY GRAPHIC REPRESENTATIONS SECTION BUREAU OF WAR RISK INSURANCE C.R.W.

Chart E.

cause the records show all the infections, and in many instances several prior to the onset of reported symptoms of heart disease. In most instances the clinic physicians have quite properly refrained from committing themselves to the particular one of several infections which was thought to be the actual exciting cause of the cardiac involvement.

Among 720 children patients at these cardiac clinics where case histories were particularly well reported and studied, infections as possible or probable chief etiological factors were given as follows:

(Two or more of the following infectious conditions were reported in many cases.)

| | |
|---|---|
| In 279 cases, | acute rheumatic fever (growing pains, etc.) |
| 282 | acute tonsillitis or sore throat |
| — | syphilis |
| 53 | scarlet fever |
| 63 | diphtheria |
| 130 | pertussis (at one clinic only) |
| 232 | measles |
| 207 | carious teeth (none at one clinic) |
| 49 | chorea (none at two clinics) |

Ledford[1] has recently reported that in 86.8% of a group of 250 cases of acute endocarditis in a children's hospital ward, the cardiac infection followed directly acute rheumatic fever, chorea, or tonsillitis. So sharp-cut a statement can rarely be made for the patients who come with an established valvular heart lesion and a history of a multitude of infections. While the ultimate classification of all or even the most important direct etiological factors in causing organic heart disease must await more precise knowledge we can, for convenience in guiding the always elusive public health educator and propagandist, with safety state that of the infections, syphilis and rheumatism are positive causes, that diphtheria, typhoid fever and scarlet fever are presumptive causes, that measles and whooping cough are under serious suspicion, that infected tonsils and diseased teeth and cryptic foci of various kinds may, in many cases, prove to be the true cause of what is called rheumatic or cardiac infection, that senescence, arterial hypertension with or without renal disease, and the insidious diseases of occupation which are often mistakenly reported as arteriosclerosis, play a large but wholly undetermined rôle. The elements leading to extension of existing lesions, to the disturbance of mechanical equilibrium of a heart developed to compensate for an orderly and well adjusted activity, are so multifarious and fall so clearly within the clinical field that I shall make no attempt to comment upon them, except to say that from the assembled reports of many patients under specialist clinic control in New York City, the impression grows constantly stronger that re-infection and a state of poor nutrition and inadequate sleep and rest are more common, potent and serious causes of renewed or original decompensation than are sudden over-exertion of physical strain in play and work. It becomes more apparent that the immediate needs of the clinician and the remoter but none the less vital needs of the community can be met best by a central office or library of clinical records assembled on sound statistical lines.

What is important to obtain but not yet, available, is a careful clinical and pathological study of the age at infection or onset of valvular or other organic heart disease. The material is now at hand and developing day by day in the practice of a multitude of physicians throughout the country, but is nowhere assembled, and, as a rule, the fact of cardiac involvement after any infection is not recorded or remembered, and the date of onset or invasion is a matter of mere guess work when the mechanical end results of the disease have brought the patient under medical care.

Among dispensary patients, most of the children have had the usual communicable diseases and frequently, also, have passed through attacks of the respiratory diseases, such as pneumonia and influenza. Reliable history by parent or child as to the prior importance or even occurrence of rheumatic or tonsillar infection is rare.

While referring to the clinical material under observation at 29 or the 31 cardiac clinic classes in New York City, for which reports have been available, it is worth while to consider the relative adequacy for the estimated need of a community for the services now provided in New York City in this field. Here again, we can with benefit use as a basis for comparison the well established services of the tuberculosis dispensaries. There are, and have been for a

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[1] Ledford, H. P.: American Journal of Diseases of Children, February, 1921, 21, No. 2.

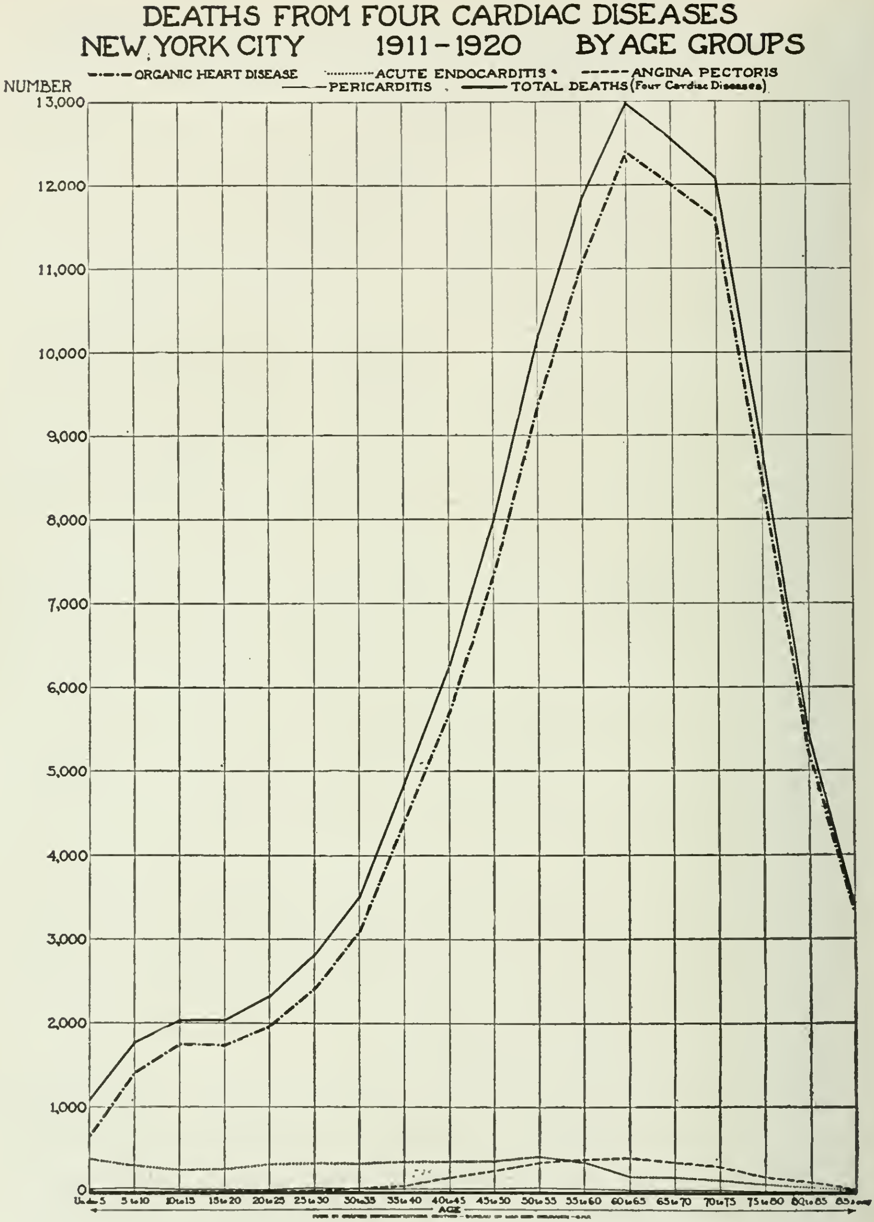

DEATHS FROM FOUR CARDIAC DISEASES
NEW YORK CITY 1911-1920 BY AGE GROUPS
ORGANIC HEART DISEASE
ACUTE ENDOCARDITIS
ANGINA PECTORIS
PERICARDITIS
TOTAL DEATHS (Four Cardiac Diseases)
NUMBER
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Under 5
5 to 10
10 to 15
15 to 20
20 to 25
25 to 30
30 to 35
35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
60 to 65
65 to 70
70 to 75
75 to 80
80 to 85
85 & over
AGE

CHART F.

number of years, in operation in the five boroughs of New York City, 29 tuberculosis dispensaries, and their number and distribution have been found reasonably adequate for the needs of the community, this provision amounting to 10 clinic hours of medical services per week for each 100,000 of population, as compared with 20 in Boston, 13 in Philadelphia, and 10 in Cincinnati, cities in which the field is considered to be well covered. (There are reported to be 550 tuberculosis dispensaries in operation in the United States).

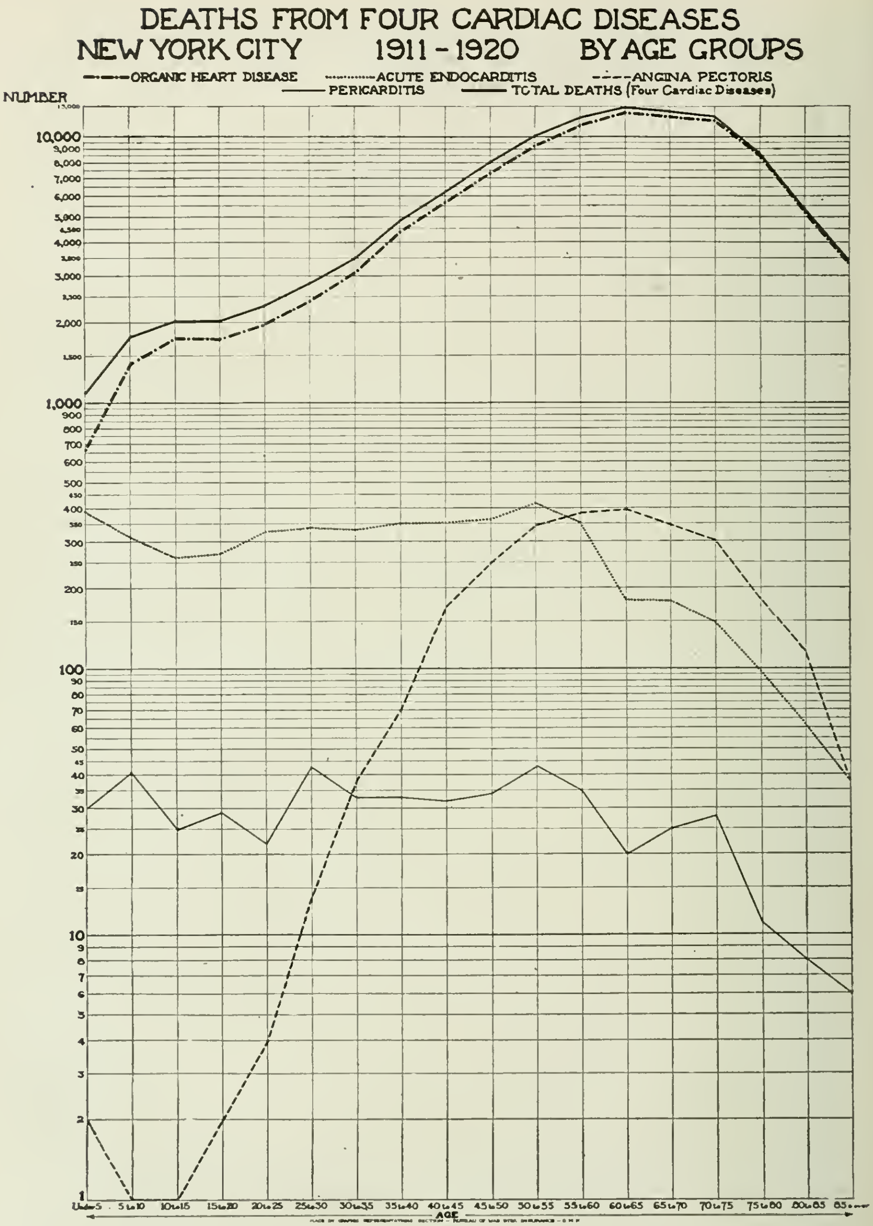
On the basis of the death rate from tuberculosis in New York City, 1920, we can estimate that there are 35,660 active pulmonary cases of the disease, of whom about 27,000 are registered with the Dept. of Health. Of the registered cases, 11% are in attendance at or in contact with the tuberculosis dispensaries, or approximately 3,000. Although we may consider that 2% of the population have cardiac diseases, probably not more than 1% of the population at any one time needs medical supervision for this reason, or 56,651 in 1920. On the basis of the experience with tuberculosis, we may expect about 8.5% of estimated active cases to accept dispensary care, or 4,815. However, since the period of years in cardiac diseases for which medical supervision is desirable is, in the main, much greater than is the case in pulmonary tuberculosis, we may expect a larger attendance year in and year out, from the same unit of population, at cardiac clinics than at tuberculosis clinics.

It is of considerable interest to note that the estimate of expected attendance and needs for dispensary care of cardiac diseases closely approximates the current facts, since there are upward of 4500 active cases in attendance at the 31 special cardiac classes in dispensaries now in operation throughout New York City. The attendance is given accurately for 29 of the 31 classes (4342 on May 1st), the last two having been put in operation too recently to have developed an accurately recorded clientele.

Without going further into the subject of the extent and distribution of cardiac diseases and accepting as proved the major importance of the deaths, the sickness at all ages, the urban and rural incidence, the seasonal distribution of deaths, the effect on life expectation in both black and white races, of the cardiac diseases, and admitting that we are yet without the important facts as to the exact etiologic factor in all cases, or the ages at which the various determining infections occur, let us turn to the problem of providing for such relief from this incubus upon our fellow citizens as we are capable of.

If we look the country over and search for an effective demonstration of an effort to bring to the aid of those already afflicted the best that the medical sciences and social organizations are capable of, I think you will agree with me that the Association for the Prevention and Relief of Heart Disease in New York City must be recognized as having most nearly approached the goal. If we may, as we love to do, think back to the time when what we see now in operation was a vision in the mind of one practical idealist, it seems to me we must give Dr. John Huddleston, the friend and adviser of a multitude of the handicapped and the suffering, full credit for the conception of much of our present program. He had grown up with, and played a leading part in, the development of tuberculosis control and service, of care and prevention, over a period of twenty years before his death, in 1915. He was convinced of the need and the opportunity to organize the always willing but individualistic services of physicians, and the generous but sentimental public for the early detection of heart diseases in children, the provision of such hospital and convalescent beds for those with acute infections as will permit of rest and recovery, instead of permanent mechanical damage of muscle and valves, the orderly and controlled supervision by doctors and nurses devoted to this highly technical specialty, of all those whose usefulness and safety depends upon their learning, as in a post-graduate university of applied hygiene, their limitations and their possibilities the provision of such guidance in school, shop and employment agency for child and man as will set at naught the handicap of the heart by intelligent selection of occupation. The proof that this vision was that of a prophet as well as of a scientist, is the astonishing rapidity with which the ideas took root, the eager workers fell to at the task and the realization of the project has approached a very considerable refinement and success.

It is a matter of especial satisfaction to the associates of this good physician that a fund collected by his devoted patients was turned over to a group of physicians to administer and use in defraying the expense of studies in the


DEATHS FROM FOUR CARDIAC DISEASES
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20
15
10
9
8
7
6
5
4
3
2
1
Under 5
5 to 10
10 to 15
15 to 20
20 to 25
25 to 30
30 to 35
35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
60 to 65
65 to 70
70 to 75
75 to 80
80 to 85
85 and over
AGE

CHART C.

problem of home and dispensary direction of children with cardiac diseases. Another fund, for special research work in cardiac disease, has recently been created by Mr. Frank G. Sturgis. The facts as to organization, costs, plans and results of this distinctly medical undertaking can all be more appropriately read from the reports and publications of the Association than in this lecture.

A program for control of heart disease for a city so nearly the population of the Boston metropolitan area, namely, Cleveland, Ohio, as to be entirely applicable to Boston, was prepared a year ago in collaboration with the officers of this Association, and is published as part of the Cleveland Hospital and Health Survey (1920, Part ii, pp. 213-220).

The more important professional results of this movement in New York City have been, first, the assembling for a common purpose of a particularly keen group of students of clinical cardiac disease and their organization into a professional association ready to undertake such mutual studies and to establish such common standards of reports, methods, terminology, etc., as are prerequisites for study of the small army of patients already reporting daily for orders at the dispensaries. Already a terminology is in effect which permits of a common language in discussing patients in bulk, and plans are well advanced for such use of clinic records and their central tabulation and collating that the separate physicians will each be making his important contribution without bearing the, to him, distasteful burden of clerical and statistical analysis. The following terminology is in general use in the dispensary care of cardiac patients in New York City:

### Functional Classification of Cardiacs.

#### ORGANIC HEART DISEASE.

*Class I.* Patients who are able to carry on their *full habitual activity.*

*Class II.* Patients able to carry on *diminished physical activity.*

  *A. Slightly decreased.*

  *B. Greatly decreased.*

*Class III.* Patients who are able to carry on *no physical activity.*

#### POSSIBLE HEART DISEASE.

*Class IV.* Patients who have abnormal physical signs in the heart, but in whom the general picture, or the character of the physical signs leads us to believe that they do not originate from cardiac disease.

#### POTENTIAL HEART DISEASE.

*Class V.* Patients who do not have any suggestion of cardiac disease, but are suffering from an infectious condition which may be accompanied by such disease: *e.g.*, rheumatic fever, tonsillitis, chorea, syphilis, etc.

This organization has served to remind us of the unlimited fields of clinical research that can and must be cultivated apart from laboratories, or even hospitals, and carry us into countless homes, the final answer to our questions depending upon the record of a life time. Can we, perhaps, tell our children what is the true cost of a life time of heart disease to the community and to the individual? With 6,000 patients to study, some of the still disputed questions of the etiology also will soon be answered.

For those who wish to undertake the operation of a special class for either children or adults, a warning must be given as to the danger of overloading with patients who cannot be continuously followed up. It is no less dishonest in a dispensary than for a private practitioner to accept responsibility for more patients than he can thoroughly well care for. It is found that not more than 150 active cases can be adequately examined and followed up by one special class. What is considered adequate personnel for one class holding one session a week is:

| | |
|---|---|
| One physician @ $3.00 an hour | $450 a year |
| One full time registered nurse | $1800 a year |
| Clerical help @ $.50 an hour | $100 |

Space, and suitable office equipment and supplies, light, heat and telephone service, can usually be provided in an existing dispensary plant. A transportation fund will be needed to permit the nurse to visit patients for follow-up, unless the population served is in a small area adjacent to the dispensary. The exact information is not yet available, and yet a sufficient number of cases have so far been studied to make it quite clear that by an expenditure of not to exceed $15.00 a year, not only can the great majority of active cardiac patients be so guided and supervised as ambulatory patients, from the dispensary or at their homes, that periods of hospital care ($3-$5 per day) are less frequent and of shorter necessary duration, but that the earning capacity of the adults, and the school attendance of children, is increased far beyond the money cost of the dispensary care. As it costs less to save an infant life than to provide its burial expenses, so investment in medical supervision of cardiac patients pays truly astonishing dividends in services to the community and in happiness of life for these handicapped people.

In addition to the 31 special classes for cardiac disease in New York City (14 for children and 17 for adults, several of the latter in the evening), there are known to be in operation 28 more in other of the larger cities in the country.

| | |
|---|---|
| Albany | 1 |
| Boston | 8 |
| Chicago | 4 |
| Cleveland | 1 |
| Des Moines | 1 |
| Detroit | 1 |
| Iowa City | 1 |
| Long Branch | 1 |
| Milwaukee | 1 |
| Minneapolis | 2 |
| Philadelphia | 4 |
| Rochester | 1 |
| St. Louis | 2 |

The most effective and constructive service for prevention and relief of heart diseases is that close coördination of school and clinic found where the examination of the children picked out by the school medical inspector is taken up by a clinic class operated in the school district, the chief of the cardiac class becoming the specialist adviser for the school and home career of the cardiac school child, just as the tuberculosis specialist has guided the anemic and pre-tuberculous child in the open air classes of the public schools.

There are now 12 special cardiac classes in the public schools of New York City (about 550 open air classes for the pre-tuberculous) each class of about 25 children.

The most ambitious program and the most nearly perfect facilities for school and clinic care of cardiac school children is to be found in the three special classes at 8th Street and Avenue B, where they occupy a building apart from the regular school buildings, provided with certain conveniences, elevators, rest rooms and exercise space, etc., asd their entire régime and individual prescription for physical training, rest, etc., is under the direction of the special clinic at the New York Post Graduate Hospital (Dr. Robert H. Halsey and associates). Details of results of the work in this special group of patients, showing the progress in school attendance, development of cardiac balance, increase in physical fitness, etc., will be presented at the meeting of the American Medical Association next week. It may be stated that one-third of the children picked out as having some cardiac defect of sound or function are found to be in need of medical direction for definite organic cardiac disease. There is great benefit to children in relieving them from the fear of the term, "heart disease," and teaching them how normal and natural their lives may be within wide limits. Supervision produced a gain of 13.5% in school attendance. Expressed in school days, each child gained three weeks of school attendance under special clinic and class care.

The clinicians of these special cardiac classes have before them the questions put to you by Theodore Janeway in 1916: "Whence came these diseases and why? What are their primary, and what their accessory causes? How do they reach their baneful development? On finding the right answer to these questions, depends the final attainment of the goal of our profession, the prevention of disease. By as much as the proverbial value of prevention exceeds that of cure, does the importance of study of the causes of disease surpass that of the manifestations, its results, or its treatment."[2]

We see heart diseases as we have found tuberculosis, venereal diseases, cancer, infant mortality, and blindness, preventable by a multitude of means, each aimed against a specific fact or a direct or immediate effect. Such standards have been put into effect in clinics successfully operated for a number of years, that detailed consideration of their functions, objectives and accomplishments need not be repeated. What is, I believe, the best description of the most complete and efficient medical organization for cardiac children during the non-hospital periods of their lives, has been given in the *Hospital Social Service Quarterly* by Dr. Wm.

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[2] Janeway, T. C.: "Etiology of the Diseases of the Circulatory System," Shattuck Lecture, BOSTON MEDICAL AND SURGICAL JOURNAL, June 29, 1916.

P. St. Lawrence and Miss E. Louise Adams, the nurse in charge.

This class for cardiac children at St. Luke's Hospital has been operating for five years and has made important additions to our knowledge of methods and results. While we see the correction of many evils in progress under guidance of such clinics as this, it is well to review the situation of the cardiac child where it lacks special provision. St. Lawrence and Adams have well described it in the introduction of their paper. "In our general Pediatric Clinic, few cases have presented a more pathetic and discouraging outlook than the cardiacs. Their care has been haphazard and, undoubtedly, in many instances, improper. As their lives have been restricted almost to the point of uselessness, they have been a burden to their families and to themselves. Their education and development have been sadly neglected and, in many cases, it has seemed questionable whether life for them was worth while. They have repeatedly sought help which we have not known how to give. In the cases with milder lesions, we have unnecessarily made life a burden. The severer cases have been too forcibly impressed with the certainty of the coming outbreak. Our management has been without plan and has consisted largely of meeting the individual symptoms. In many instances, this has only meant waiting for the eventual failure, with the hospital ward as the ultimate refuge. Discharge and return home has been but the first phase of another cycle, and not infrequently the final cycle was early brought to a close."

The studies upon cardiac tolerance in children, by Dr. May Wilson, at the Nursery and Childs Hospital, the studies under the Huddleston Memorial Fund, by Dr. Charles Hendee Smith and his associates, both already reported upon, and the studies of Dr. John Wyckoff at the University and Bellevue Hospital Medical College Cardiac Class, in etiology and duration of the disease in adults, are a few of the important contributions to medicine of these new clinical services.

Through the courtesy of Dr. Wyckoff, I am permitted to give you the preliminary results of a study of 200 cardiac patients reported from his clinic, as follows:

Of the 100 patients in whom rheumatism, tonsillitis and chorea, together or separately, played probably the exciting etiological rôle (65 males and 35 females), they were distributed as follows, by decades: 10 to 19 years, 24; 20 to 29 years, 39; 30 to 39 years, 16; 40 to 49 years, 15; 50 to 59 years, 5; 60 to 69 years, 1; total, 100.

Of those giving a history of syphilis as the probable primary cause, the distribution was: 30 to 39 years, 3; 40 to 49 years, 8; 50 to 59 years, 10; 60 to 69 years, 2; total, 23.

Of those evidently secondary to some particular septic process, the distribution was: 10 to 19 years, 1; 20 to 29 years, 1; 30 to 39 years, 4; 40 to 49 years, 1; 50 to 59 years, 1; total, 8.

Of the remaining 69, there were secondary to nephritis, 1 at 40 to 49, 2 at 50 to 59, and one unknown; total, 4.

Of the other 65, which include senile and, probably, those of arterial and renal origin, the distribution was: 10 to 19 years, 6; 20 to 29 years 12; 30 to 39 years, 12; 40 to 49 years, 11; 50 to 59 years, 19; 60 to 69 years, 3; 70 to 79 years, 2; total, 65.

Grand total, 200.

The distribution to early decades of those of so-called infectious rheumatic origin was to be expected, and the location of syphilitic hearts in the decades after 30 is also in agreement with the usual incidence of syphilis in the population as a whole, or at least the occurrence of the structural sequellae.

A further analysis of the 100 cases with a probable rheumatic tonsillar or chorea origin, according to the period which elapsed between the date of probable infection and the date when the patient knew he had a cardiac disease, either from appreciation of the importance of the subjective symptoms or by direct statement from a doctor, shows that, on the average, these patients did not know that they had cardiac disease until 5.36 years after infection. The periods, of course varied widely from cases where knowledge was immediate at the time of the acute sickness of origin, to those who had evidently had their disease 30 years before they knew what was the matter with them, a measure of the failure of the patient and the physician to meet, and the latter to meet the full need in each case.

Of the twenty-three syphilitics, the average time before knowledge of their cardiac involvement was 17.65 years after infection (the range being from one to 34 years after).

A further interesting point is the length of time after knowledge of infection before patients first attended a clinic. Of the 100 of the rheumatic group, the average delay was for 8.5 years after knowledge of infection before the patient appealed for relief at the clinic, and with the syphilitic group of twenty-three, the period was 21.4 years.

These are practically all patients of the dispensary class, in whom economic limitations have probably prevented their using medical advice as early as they would have been tempted to if the necessity for continued work had not been so pressing, but the figures are sufficiently impressive to guide us in much of our preventive program.

The cardiac is entitled to education as to the merits of early diagnosis and the difficulties of cure or relief in advanced stages of these diseases, as the tuberculous are, and there can be no doubt that the educational campaign to reach the incipient tuberculous has born fruit, for the percentage of negative cases on first examination and the percentage of incipient cases in the clinic attendance have increased with great rapidity in recent years.

As it was with the tuberculosis movement, so in the present effort to bring service to the cardiac, we find the pressure and initiative strong from the ranks of the social workers' profession. One of the first problems considered by the Hospital Social Conference in New York some ten years ago was the provision of convalescent care and suitable vocational direction, training and employment for handicapped cardiac dependents. No adequate or consistent professional service for cardiac patients can omit the two elements which chiefly contribute to a shortening of periods of total disability, namely, the adjustment of the patient to a substantially gainful occupation suitable to his mental and physical capacities and the completion of the hospital treatment by a convalescent training which will lead directly and, under medical supervision and encouragement, into work instead of dependency. The chronic cardiac, no less than the chronic tuberculous, is always in danger of losing his moral fibre, the essentials of character upon which self-support and self-respect depend, because of the failure of even our best technical medical services to inject into their therapy the element of moral stamina and an outlook of hope and determination instead of permitting a subsidence into the easy indolence of those who enjoy their invalidism.

For information and helpful suggestions as to the problem of employment for cardiacs, and the way it may be met, clinicians, as well as relief agencies and hospital administrators, should study the reports of Mrs. I. M. Duggan, Director of the Employment Bureau for the Handicapped of the Hospital Social Service Association of New York City. The conception of this problem from the hospital point of view, has been nowhere better expressed than in the following paragraphs from Mrs. Duggan's second paper in the *Hospital Social Service Quarterly*, 1920, 11,227:

"As Emerson[3] has well expressed the situation, the hospital enters into a tacit contract with each patient it accepts, that it will try to reach the cause of his disease. But is the hospital, in reality, living up to the spirit of its contract if it does not help a cardiac find a lighter job after his first admission? Is the hospital not squandering trust funds to spend money to treat a patient if they know that the good work done will be quickly lost if he returns to his old occupation? If the proper treatment of a cardiac is not drugs, but a change of occupation, should this not be supplied, just as an operation would be given free to a hernia papatient, or quinine to a case of malaria? But objection is made to the cost of supplying the machinery necessary for this placement work. The cost of finding a cardiac lighter work is far less than the cost to the same hospital of this cardiac, who will return repeatedly for longer and longer periods if he is allowed to undertake his former occupation.

If the hospital superintendents would only realize how many days of hospital care could be saved their institutions by the proper employment of cardiacs upon their discharge from the hospitals, we would see an employment bureau for cardiacs, supported by the hospitals themselves, established in every community."

In the field of convalescent care, there have been no more valuable contributions to our knowledge of the technic of institutional care, occupational and recreational training and resources for the immediate post-hospital period for the cardiac patient than have appeared from the experience of the Burke Foundation Convalescent Home at White Plains. The reports and recommendations for this particular type of medical service presented in the last few years by Dr. Frederic Brush, show an increasing accuracy in determining the kinds of patients for whom a wide range of activities are not only permissible but necessary, and a courage in breaking paths into fields of work and play heretofore forbidden to the cardiac.

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[3] Emerson, C. P.: Hospital Social Service Quarterly, 1919, 1, 268.

As a mark to set for future accomplishment by the hospital services of a community, we may use estimates for the need of convalescent beds. If, as seems probable, on the basis of experience in our large cities, we need about five general hospital beds for every 1000 of the population and for every 100 of the hospital patients discharged from care, 12 will need institutional convalescent care (this number to include provision for those needing convalescence, and coming from dispensary and private care), we find that one out of every five convalescent beds will be required for cardiac patients (2/3 of the beds for children under 14). The cost of such care, even including transportation and admission office expenses, is about half the daily cost of hospital care in general hospitals. In New York City, of the 500-600 beds considered necessary for cardiac convalescents for its population, 300 are already available, and others are in preparation. Tentative conclusions have been arrived at for the guidance of those wishing to obtain convalescent care for cardiacs after hospital and dispensary treatment and are here quoted from proposals considered by the Associated Cardiac Clinics of New York City:

"I. Convalescent homes should accept patients with heart disease only after they have been examined at a cardiac clinic.

II. Patients proposed should be held to the following types·

1. Those needing convalescence for other conditions than heart failure, but who may incidentally have heart defects (under Class I of the classification of cardiac patients, as adopted by the Association).
2. Convalescents from acute heart failure, who have been out of bed for some time, in the hospitals or at home, and who show no dyspnea after moderate exercise. (Classes II and III of the classification of cardiac patients, as adopted by the Association.)
3. Patients who are not convalescent from acute heart failure, but who show signs of heart and general fatigue while under observation at the clinic, and who need shorter preventive stay. (Class III of the classification of cardiac patients as adopted by the Association.)
4. Younger persons yield best results and are given preference. [*Note.*—Too few persons are sent of the types indicated under 1 and 3, above.]

III. The following types of patients are not considered suitable for convalescent treatment:

1. Convalescent from acute rheumatic fever, not to be sent until joint symptoms have been absent for three weeks.
2. Cases that show lung congestion, or a tendency to bronchitis or asthma.
3. Persons with marked renal complications.
4. Those mentally, nervously or otherwise unpromising for the essential active coöperation and long stay. This would include patients who are likely to develop homesickness, or who might be unable to adapt themselves to a régime.

IV. The following coöperation shall be given by the submitting agencies:

1. Help to lessen the strain and fatigue of the admission day (transportation to admission office, etc.).
2. Hospitals should take back patients at the beginning of a relapse that may develop while at the home.
3. Social service should follow up cases promptly on their return to the city, to prevent relapse which frequently occurs at the time; placing the patient in suitable occupation as soon as possible, to avoid the bad mental effect of being unemployed."

An element of social justice, not yet firmly established or, one might say, yet conceived of in most parts of our country, for the proper benefit of cardiac patients, is some form of compulsory disability insurance which will provide for financial help where employment is responsible for the development, or extension of cardiac disease, or death from it.

The probable relationship of cardiac infection to diseased tonsils is so firmly believed that we should consider our ability to meet the necessities of this situation. How many of the children of a city need to have their tonsils removed? According to Dr. Geo. Goler of Rochester, 2.6% of the total population, or 6.5%

of the children under 15, need tonsillectomy to save them from various direct and indirect results of infection through this portal of entry. In New York City, in 1920, a careful study, based on medical examination of school children, showed that about 55.000 children needed tonsillectomy. As a matter of fact, 46,273 operations for tonsillectomy were performed, and chiefly for children, in the hospitals and dispensaries of the city during 1920. It is believed that by proper central coördination, all tonsillectomies that are needed can be arranged for in existing facilities. Somewhere between 1% of the total population per annum estimated as needing tonsillectomy, in New York City, and the 2.6% considered to be in need of this treatment in Rochester, probably lies the truth of the situation. Possibly the reduction of tonsillar tissue and exclusion of infection from the cicatricial tissue by x-ray treatment, may simplify this problem. Similarly, the requirements and facilities for correction of oral sepsis should be studied and met. The present day inadequacy of prophylactic and curative dental care for old and young, is too well known to dwell upon here.

Why, then, do we say that the prevention of heart disease is a practical public health problem?

Because it is the cause of the greatest number of deaths and disabilities in the United States;

Because cardiac diseases fall within the class of preventable diseases, since their exciting causes, or infections, are severally communicable or preventable diseases, or both;

Because the individual has not the knowledge to, nor can he, control his life and environment, his schooling, treatment, employment or hazards of life alone, or escape by his unaided, individual efforts, the origin and development of these diseases.

Can we not expect that the extension of control of the water and milk supplies, the further reduction of the exanthemata, the infections of tonsils, teeth, and of the respiratory tract, will presently reduce the incidence of heart disease among the children of today so that the death rates of thirty and sixty years from infection will be reduced? Is it too much to believe what we have already seen, beginning in the past two years, the increasing vacancies in hospitals for care of the tuberculous, may with a hoped-for 50% reduction in this disease in the next thirty years, become so general that these sanatoria, for the most part ideally suited to, or easily adaptable for, the care of cardiac convalescents, will be turned into great salvage plants and training schools for the incipient, moderately advanced, arrested and active cases of cardiac diseases.

The reduction of typhoid has been so conspicuous and the permanence of its control so assured that we have a right to prophesy a reduction of that group of myocardial deaths shown to bear a direct relation to previous typhoid infection.

We do not know that syphilis has been reduced, but we believe this can be accomplished. We do know that scarlet fever, measles, pertussis and diphtheria are less frequent causes of death by 50-80%, than they were fifty years ago. It is suspected from some rather inconclusive hospital records that acute articular rheumatism has been reduced in recent years, and it is supposed that this is, in part, due to the removal of infected tonsils, the compulsory pasteurization of milk in our large cities, and the extension of oral hygiene, with its accompanying reduction of oral sepsis. (Dr. Alexander Lambert reports a reduction in admissions for acute rheumatic fever during the period 1907-1919, at Bellevue Hospital, from 2.45% of all hospital admissions to .52%.)

We see in the great incidence of cardiac diseases and deaths a token of our degree of failure in a crude, inconsistent and incomplete program of preventive medicine. These deaths and disabilities, represent the vouchers of our administrative stinginess, our policy of parsimony toward our health services. Even though we have no panacea or specific, we cannot be excused for letting the products of our carelessness march in an increasing army to the grave.

What is our professional answer, our program for action? First, we must make the possibility of prevention, prevention of infection, prevention of cardiac damage, prevention of extension of lesion or disability, and postponement of death from heart diseases, real to the practitioner of medicine.

As Dr. Thomas McCrae has well said:[4]

"The problem facing both general practitioner and consultant is to detect the persence of lesions in their early curable, or healable stage, and to recognize the first indications of failure of an established balance, reserve, or compensation."

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[4] Penn. Medical Journal, February, 1920, Vol. xxiii, p. 267.

All this means the introduction of a consciousness, a definite knowledge, and interest in the prevention of heart disease through medical education. We can no longer await the coming of patients in our offices, but must search for them among the presumably healthy and attack their disabilities before the patient is aware of them, and this through a development of a habit in the whole community to seek a thorough medical examination once a year for adults, twice a year for children under fourteen, and always after apparent recovery from any acute febrile disease.

We owe it to the great cardiac population of our country to release them from the traditional medical inhibitions, to encourage use instead of permitting atrophy. We owe the public intelligent warning of the seriousness of the rheumatic infections. The public owes us adequate provision of those institutional facilities we need for their care, and suitable training in self-support. Organized groups under medical leadership are necessary to develop the resources of our communities for the prevention and relief of heart disease.

The research problems that crowd upon us cover a wide field of laboratory sciences, medical practice and social economics, and involve the medical and associated professions. It is to be noted that public health and problems in prevention are subject to the same limitations which apply to the practice of personal medicine, namely, that treatment to be effective, or permanent in results, must be based on accurate diagnosis, and that communities differ almost as widely in their idiosyncrasies, their resources, their reaction to advice, as do individuals. No detailed recommendations, therefore, are offered for the remedy of the conditions of your respective communities based on diagnosis and treatment elsewhere, but may I hope that as you think over the symptoms and proofs of a widespread public disability which I have offered, you will search for the causes in your own environment and take an active part in the attack upon heart diseases with the determination characteristic of courageous and well informed physicians everywhere. Your Hippocratic oath requires this of you.

### BIBLIOGRAPHY.

Reports of the Massachusetts General Hospital Social Service Department, Boston, 1911, 1918.

Reports of the Children's Heart Hospital of Boston, Mass. Annual since 1912.

The Trade School for Cardiac Convalescents Report, 1913-1914, 1914-1916.

Reports of the Bellevue Hospital Social Service Department, New York, N. Y., 1914.

Reports of the Peter Bent Brigham Hospital, Boston, Mass, 1915-1919.

Reports of the Burke Foundation, White Plains, N. Y., 1915, 1916, 1917-1918.

"Heart Disease and its Industrial Relations," Warren Coleman, M.D., American Journal of Public Health, 1915, vi, No. 5, 452.

"The Prevention and Relief of Heart Disease," Weekly Bulletin of the Department of Health of the City of New York, 1916, v, No. 37.

"Heart Disease in Infancy and Childhood," A. L. Goodman, M.D., Archives of Pediatrics, 1916, xxxiii, No. 12.

"Suggestions for Municipal Control of Carditis," Thomas B. Hegeman, M.D., Monthly Bulletin of the Department of Health of the City of New York, 1917, vii, No. 2.

"Recent Statistics of Heat Disease, with Special Reference to its Increased Incidence," Frederick L. Hoffman, Jour. A. M. A., 1920, lxxiv, No. 20, 1364.

"The Organized Care of Cardiac Children," William P. St. Lawrence, M.D., Hospital Social Service Quarterly, 1920, 11, 151.

"Heart Disease as a Public Health Problem," Lewis A. Conner, M.D., Jour. A. M. A., 1920, Vol. 74, No. 23, p. 1567.

"Effect of Tonsillectomy upon the Recurrence of Acute Rheumatic Fever and Chorea," William P. St. Lawrence, M.D., Jour. A. M. A., Oct. 16, 1920, Vol. 75, pp. 1035-1041.

First Report of "The Association for the Prevention and Relief of Heart Disease" (covering the period from its incorporation, Dec. 18, 1915, to Jan. 1, 1921).

"The Incidence of Acute Rheumatic Fever at Bellevue Hospital," Alexander Lambert, M.D., Jour. A. M. A., April 10, 1920, Vol. 74, pp. 993-995.

Reports of the Huddleston Memorial Class for Cardiac Disease in Children, by Charles Hendee Smith, M.D., Bellevue Pediatric Dispensary, 1917, 1918-1919.

"The Incidence of Heart Disease in Adults," by Louis I. Dublin, Ph.D., New York Medical Journal, April 10, 1920.

"The Treatment of Heart Disease by More and Longer Supervision," Robert H. Halsey, M.D., New York State Journal of Medicine, September, 1917.

"The Administration of Digitalis," T. Stuart Hart, M.D., New York Medical Journal, July 31, 1920.

"Employment for the Handicapped:" II. The Cardiac, Ida M. Duggan Hospital Social Service Quarterly, 1920, 11, 227.

"The Convalescent Treatment of Heart Disease by Exercise Applied through Natural Work and Play Methods," Frederic Brush, M.D., The Medical Record, Feb. 12, 1921.

"Clinic of Dr. T. Stuart Hart"—Presbyterian Hospital. "The Functional Activity of the Heart. Method of Classification," Medical Clinics of North America, March, 1921.

"Occupational Therapy in Heart Disease," Frederic Brush, M.D., The Modern Hospital, January, 1921, issue, Vol. xvi, No. 1.

"The Cardiac Clinic of Central Free Dispensary—Rush Medical College," Fred M. Smith, M.D., Hospital Social Service, June, 1921.

"Mary Zinn Home for Convalescent Children," Ernest P. Boas, M.D., Hospital Social Service, May, 1921.

"Social Treatment of Children with Cardiac Diseases of Children's Hospital, Boston, Mass.," Miss Mabel Wilson, Director, Social Service Department, Hospital Social Service, 1921, 111, 2.

"Heart Affections in Relation to the Labor Market," R. O. Moon, M.D., F.R.C.P., British Medical Journal, May 8, 1920.

"Observations on the Nature and Symptoms of Cardiac Infection in Childhood," F. J. Poynton, M.D. Reprinted from British Medical Journal, March 2, April 13, July 6, and September 21, 1918.

"The Health of Food Handlers." A coöperative study by the Department of Health, the Metropolitan Life Insurance Company, and the American Museum of Safety. Report prepared by Louis I. Harris, M.D., and Louis I. Dublin, Ph.D., Monograph Series No. 17, Department of Health of the City of New York, August, 1917.

"Heart Disease in School Children," Charles Hendee Smith, M.D., "Mother and Child"—Vol. 2, No. 1, January, 1921. Published by American Child Hygiene Association.

"The Cardiac Clinic of Lenox Hill Hospital," Walter F. Bopp, M.D., Jour. A. M. A., Dec. 4, 1920, Vol. 75, pp. 1587, 1588.

"On the Value to the Community of Organized Effort for Control of Heart Disease," Lewis A. Conner, M.D. Read at stated meeting of College of Physicians, Philadelphia, May 4, 1921. (To be published.)

"Convalescent Institutions in the Care of Heart Disease." Read at stated meeting of College of Physicians, Philadelphia, May 4, 1921. (To be published.)

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## Original Article.

# THE ESSENTIAL FACTORS OF CANCER CAUSATION.

By James W. Shannon, M.B., San Diego, California.

(Continued from page 573.)

It is impossible to follow the course of water through the whole of the alimentary tract for the reason that, after leaving the stomach, it gradually becomes absorbed. We know, however, that it passes rapidly through the mouth, pharynx, and esophagus until it reaches the stomach, *where it is retained for a considerable time,* and that after leaving the stomach, there is no obstruction to its passage through the duodenum or other portions of the intestinal canal. The only important difference. therefore, between the stomach and the mouth, pharynx, esophagus, or duodenum is in the greater length of time during which water is retained therein, and it is for this reason only, and not because lesions are present more frequently in the stomach than in other parts, that gastric cancers outnumber cancers of all other abdominal organs together. The attack of cancer falls on the pyloric region because it is the most common seat of gastric lesions, but inasmuch as there is good reason to believe that lesions of the buccal cavity and of the duodenum are more frequent than in the pyloric region, we can hardly doubt that, if the opportunities for exposure of lesions in all these parts to water were equal, cancers of the mouth and duodenum would then outnumber cancers of the pylorus.

With regard to other parts of the alimentary system, our knowledge of lesions and of their exposure to water is insufficient to warrant our forming any conclusions. Nevertheless, if we believe that the principle of coöperation between lesions and water is true in the case of cancers of the mouth, stomach, and duodenum, we must also believe that it is true in the case of the intestines, peritoneum, liver, and other parts of the alimentary system lying beyond the range of observation. There is reason to think that cancer of the rectum is due, not to water which has passed through the alimentary canal, but to water deliberately applied in the course of the treatment for constipation and other affections.

Probably no organ or part of equal size is so frequently the seat of affections tending to result in lesions as the lungs, but notwithstanding this, there are few parts or organs in which lesions are better protected from water, or which show less tendency to become cancerous. The lungs, however, are not peculiar in this respect, since a brief consideration of the facts of cancer incidence as a whole will show that, whereas the greater proportion of the risks from cancer are borne by parts and organs which are commonly exposed to water, there is, in all parts and organs protected from such exposure, a remarkable freedom from the disease. It would be difficult to find a better illustration of this than that which is supplied by a comparison of the facts of cancer incidence upon the lungs and upon the stomach. Lesions are present more frequently in the lungs than in the stomach, and if "chronic irritation," or any other form of stimulus associated with their presence, were capable of causing cancer, we should certainly expect pulmonary cancers to outnumber gastric cancers. Since, however, the contrary is true, it is obvious that lesions acting alone cannot cause cancer, and it therefore becomes impossible to find a satisfactory explanation for the facts except on the ground that, whereas in the stomach exposure of lesions to water is almost continuous, the opportunity for such exposure can only arise in the lungs in the event of a rare accident.

Cancer of the female generative system stands second in order of frequency to cancer of the alimentary organs, not because it is more exposed to injurious influences or to water than many other parts of the body, but because of the vulnerability of one point, namely the cervix uteri. In so far as cancer is concerned, the cervix uteri stands in the same relation to the female generative system as the pyloric region does to the alimentary system, that is to say, it is the point upon which nearly the whole weight of the disease is focussed. It seems reasonable, therefore, to believe that the principles of causation which were found to be applicable to the problems of cancer in the alimentary system, will also serve to explain cancer of the female generative organs with the same degree of consistency.

The cervix uteri is, par excellence, the seat of inflammations, lacerations, ulcerations, erosions, and other lesions having a tendency to persist for months, or even years, and moreover, it is most favorably situated for contact with any water which may happen to enter the genital passages.

The female generative organs are not designed for the reception of water, and its presence in any part thereof must be regarded as abnormal; nevertheless, it is an exceedingly common event, Water may unintentionally enter the genital tract in the ordinary course of bathing, or it may be introduced deliberately as a routine measure of cleanliness, for purposes of medical treatment, and for other reasons. Having once gained an entrance, it is to be noticed: firstly, that owing to the absence of evaporation and to the impossibility of removing it by any ordinary means, it remains in contact with the mucous surfaces and with lesions which may be present thereon for an indefinite length of time, and, secondly, that women who are the subjects of female diseases in general, and of cervical lesions in particular, are more likely, both for reasons of treatment and of cleanliness, to resort to the use of water than those whose organs are healthy. Thus it happens that lesions actually invite the presence of water in the female genital tract.

Cancerous manifestations in the fundus uteri, ovary, and other parts of the female generative system are rare, not because of the absence of lesions therein, but because by their situation and structural design they are protected from contact with water. Theoretically, it is possible that water or the living organisms which it contains may enter the uterine cavity and even penetrate as far as the ovary, but, having regard to the fact that these parts can only accommodate a very small quantity of water, it is certain that, even under the most favorable circumstances, they can never be exposed to water, or to the causative agent of cancer on a scale comparable to that of the cervix uteri.

When regarded superficially it might seem that cancer of the mammary gland is a departure from the rule that cancers originate at the site of preëxisting lesions, but inasmuch as any difficulties which the subject may appear to present depend, not upon a deviation from the principles of cancer causation advocated herein, but upon the sense in which the terms, "site" and "lesion" are construed, they are more apparent than real. It was said in the foregoing that the rôle of lesions in the causation of cancer is that of a channel, passage, or gateway through which the causative agent of the disease is conveyed in water to the living cells of the tissues, and if the term, "lesion" is interpreted in this sense, all considerations concerning its physical character are immaterial. In so far, therefore, as the ducts of the mammary gland are capable of serving as a channel through which water and the living organisms contained therein may gain access to the cells of the mammary substance or to the cells of the ducts *themselves,* they may for the purpose of cancer causation be regarded as a lesion, regardless of whether they are diseased or healthy. The site of breast-cancer cannot be foretold with the same definiteness as in other cases; it may be any part of the duct or glandular tissues to which water happens to gain access.

The mammary ducts, fifteen to twenty in number, converge from all parts of the gland towards the summit of the nipple where they open on the surface. Having no valves or other controlling mechanism, they are unable to offer resistance to the passage of fluids in either direction. We may judge of the possibilities with regard to the passage of water from without inwards by the fact that during the period of lactation the flow of milk through them is independent of control. Under these circumstances, it is more than probable that in the course of bathing, either by aspiration, pressure, or capillary action, water is carried to the deeper parts of the gland. The changes which supervene upon the cessation of reproductive activity are calculated to increase the potency of the mammary ducts, and thus favor the entrance of water and the possibilities of cancer in the breasts of older women.

Independently of the foregoing considerations, there is indisputable evidence that mammary cancers result from exposure to water, but before it can be fully understood, it is necessary to become familiar with certain customs of the Japanese. The reputation of the Japanese for personal cleanliness is well known. A daily bath is a national custom scrupulously observed by all persons in every class of society; but it is important to notice that, with rare exceptions, the Japanese never bathe in cold water. The bath is prepared in the evening, and by a heating device is maintained at a temperature of 113° F. to 115° F. Beginning with the head of the family, the same water is used by each member of the household in succession, including guests and servants, so that often it requires several hours to complete the process.

*(To be continued.)*

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## MUTUAL INSURANCE FOR PHYSICIANS.

There seems to be an increasing tendency to sue physicians for alleged malpractice. This inclination may be based on honest conviction that a doctor has been careless or unskillful, a desire to extort money, the suggestion of friends, or advice of attorneys. Medical practitioners are not always businesslike in recording facts and, as a rule, do not impress juries favorably by testimony on the witness stand, hence are sometimes victimized by force of circumstances. It is generally recognized that evidence of disability, or suffering, arouses sympathy in the minds of jurors, and the workings of untrained intellects do not always lead to logical conclusions. It must also be recognized that a proportion of the people respond to arguments designed to discredit the practice of medicine. The increasing number of suits, with the necessity for defence or compromise, has led some insurance companies to publish notices which announce the intention to increase rates. Physicians are already burdened by various forms of licenses, greater cost of transportation, taxation of income and many minor items; hence any method of coöperation which may tend to reduce expenses is pertinent.

A plan to form a mutual insurance company with membership confined to members of the Society, has been considered, legal advice obtained and some details formulated. A company of this sort cannot legally do business unless it is incorporated according to Massachusetts laws. The only serious obstacle is the initial expense, for the law requires that paid up premiums amounting to fifty thousand dollars ($50,000) must be secured before functioning as an insurance company. This is not insurmountable, for a mutual company can pay back in dividends a substantial proportion of its unused income after providing for a reserve fund.

The Journal office will be placed at the disposal of a company if physicians are interested and decide to incorporate it. By this plan, the Journal would provide all the bookkeeping, receive payments and deposit funds under the direction of the corporation. If the officers would be willing to serve without salaries, the only expense would be for a part-time clerk, unless the business should develop into larger proportions than now seems probable. There would be no charge for rent or salaries, and the Editor of the Journal would give bonds to protect the company against possible loss. Under these plans there would be no overhead expense, which contributes largely to the cost of insurance by companies organized for profit, or for the purpose of furnishing employment for officials.

The same auditor now employed by the Massachusetts Medical Society could examine the details of financial transactions and report to the company at less expense than would be the case for an independent organization. This company need only meet the expense of actual damages awarded, if any, as a result of any suit, for the Society now provides legal defence and, if the company should elect to have its members take advantage of the Medical Defence Act, another large item of overhead expense in insurance business would be eliminated.

If members of the Society are interested in discussing this plan, the Journal would make all announcements and preliminary arrangements, provide for meetings, employ counsel necessary in securing a charter and serve the members of the Society in any way which may be desired.

There are now nearly four thousand members, a large proportion of whom carry liability insurance.

A board of managers could pass upon questions relating to any suit, and decide upon the course to be pursued after conference with counsel provided by the Society.

It has often been suggested that physicians may have to organize for defence against various matters affecting the profession. Here is an opportunity for testing the advisability of organization in a matter of common interest.

## NARCOTIC REGISTRANTS MUST RE-REGISTER THIS MONTH.

The Internal Revenue Office is paying narcotic registrants its annual call again, to remind them that they must re-register on or before July 1, if they intend to continue handling or prescribing narcotic drugs for the period July 1, 1921, to June 30, 1922.

Practitioners, hospitals, sanatoriums and educational institutions, which constitute Class 4 of the Revenue Department's classification of registrants, have been mailed proper forms to be filled out and returned to Collector John J. Mitchell with payment of $3.00, the annual amount of tax, prior to the beginning of the period. To avoid the penalty imposed upon 1500 delinquents a year ago, they will execute the forms promptly.

Slight misunderstanding of the requirements of the Harrison Narcotic Law and amendments has arisen among practitioners, who believe they do not have to register with the Internal Revenue Office if they do not actually handle or dispense narcotics. The department has ruled that although he does not actually dispense, a physician must be registered if he wishes only to prescribe narcotics, as the registration number must be on all these prescriptions. This misunderstanding was the result of many penalties being imposed last year.

Persons desiring to discontinue handling narcotic drugs after July 1, should notify the Internal Revenue Office prior to that date so that proper steps can be taken legally to terminate the business, return all unused forms and have registration numbers cancelled. Should any person go out of business and not notify the Revenue Department, he will be carried on the bureau's records under his original registration number, and after July 1, this will cause him to be classified as a delinquent.

Instructions sent out with the forms this year call attention to the important fact that all registrants in Classes 1, 2, 3, and 4, must also register in Class 5 in order to dispense or deal in exempt preparations, although this additional registration does not require any further payment of tax.

They are also reminded that persons registering in Classes 3 (retail dealers) and 4 must prepare, under oath or affirmation, a duplicate inventory of all non-exempt narcotic drugs and preparations in their possession on the date of application, or submit an inventory of any date between the previous December 31 and the date of application when they register.

## MEDICAL NOTES.

Rural Health and Medical Service.—Minutes of meeting for organization of Committee for Rural Health and Medical Service, held in Boston, Friday, April 29th, at 11 a.m., in the office of Dr. Kelley, Commissioner of Health.

Those present were: Dr. E. R. Kelley, Commissioner of Health; Mrs. William Lowell Putnam, of Woman's Municipal League; Dr. E. H. Bigelow, Chairman Public Health Committee of the Massachusetts Medical Society; Mr. Leslie R. Smith, Master of the State Grange, representing Commissioner of Agriculture A. W. Gilbert; Dean E. M. Lewis, representing President K. L. Butterfield of the Massachusetts Agricultural College; P. W. Goldsbury, and Prof. Walter B. Cannon of the Harvard Medical School and member of the American Medical Association Council on Public Health and Instruction.

Prof. E. M. Lewis was elected temporary chairman. The following permanent officers were elected: President, Kenyon L. Butterfield of Amherst; Vice-Presidents, Dr. Eugene R. Kelley of Boston and Dr. Walter B. Cannon of Cambridge; Secretary, Dr. Paul W. Goldsbury of Deerfield.

Dr. Goldsbury reported having gone about Franklin County, visiting some twelve towns. Four of these trips were made with the Farm Bureau team, and he had had an opportunity to meet groups of people and speak briefly of plans for advance of health conditions. He had had more or less extended interviews with some 24 physicians in regard to their own problems and sounded them out with reference to the building up of a more unified clinic in Greenfield as a Centre. This clinic to include, at the first, tubercular, mental and venereal disease cases and, possibly, orthopedic cases. He described a number of these towns, how they were situated in reference to good roads, railroad lines of travel, and how they were manned by physicians, thus illustrating a need for better hospital facilities and an extension of clinical education. He also spoke of the interest that leading medical men in Boston had shown toward giving services to inaugurate such clinics at a distance from Boston. He emphasized the fact that the extension of the Home Economics work of the Farm Bureau coming up, as it did now, to the subject of nutrition, school lunch problems, etc., and the pretentious plans of social service agencies—Red Cross Society, the Public Health Associations for district and county nurses, warranted better unification of the interests of the physicians and such organization as would keep them abreast of all these advances.

Dr. Cannon has been a member of the Council of American Medical Association on Public Health and Instruction since such council was organized. He told of the work organized and developed by Dr. F. E. Sampson of Creston, Iowa, and now carried along by the Greater Community Hospital Association, which affords hospital facilities to a group of counties about, and which is designed to "promote interest and activity through auxiliary associations and societies or otherwise, throughout the neighboring communities in measures tending to conserve the public health and prevent disease and disability." The work has been a basis for modelling permissive legislation in some 20 states. Dr. Cannon hoped the Committee could meet Dr. Sampson when he would be in Boston June 6-10, at the sessions of the American Medical Association.

### *Committee on Rural Health and Medical Service.*

The "country" is the natural playground of health. Conditions should be provided to insure there all the comforts and advantages of modern life and its individual and social efficiency.

*Objects.*

To bring together all agencies devoted to rural welfare.

To promote cordial coöperation between the older and newer agencies so engaged.

To assure the highest usefulness of the country physician who gives of his best strength and service to the maintenance of the life, health, and welfare of the community. The family doctor has been a home and individual stabilizer. In the general practice of medicine, there exists an unusual opportunity to minister to the sanctity of the home, the integrity of family life, and to a protection of the individual's private interest, and in the rural field where the doctor is placed, he renders invaluable aid, not only professionally, but with his intimate knowledge, training, and experience with the human constitution and fabric, he is especially fitted to uphold the social life of the community and maintain its fullest integrity. Medical service must be given support in the way of modern comforts and equipment, conveniences, good roads, etc., all of which has an effect upon the stimulus and circulation of individual and community life.

To make such personal acquaintance with each field as will attract and encourage the support and active coöperation of all local agencies and leaders.

To help to bring to rural and needy sections better hospital advantages.

To endeavor to provide better educational and clinical facilities necessary for attracting and retaining men of competent professional ability to serve such districts.

*Committee:*

Dr. E. R. Kelley, Commissioner of Health, Boston; Prof. Walter B. Cannon of Harvard Medical School, and member of Council on Health and Public Instruction of American Medical Association, Cambridge; Dr. K. L. Butterfield, President Massachusetts Agricultural College, Amherst; Dr. Arthur W. Gilbert, Commissioner of Agriculture, Belmont; Dr. Payson Smith, Commissioner of Education, Boston; Dr. Alfred Worcester, President Massachusetts Medical Society, Waltham; Dr. E. H. Bigelow, Chairman Public Health Commission of the Massachusetts Medical Society, Framingham; Dr. G. H. Wright, Harvard Dental School, Brookline; Mrs. William Lowell Putnam, Boston; Dr. Paul W. Goldsbury, Deerfield.

The statement of the general purposes of the organization as outlined by Dr. Goldsbury, was discussed and was accepted, with the elimination of a minor paragraph.

Matters relating to the promotion of the work, and especially to ways and means of financing it were discussed. The opinion was expressed that counties and districts most to be benefited should be solicited, as far as possible, to bear the burden of expense associated with the work and that societies and associatious should be interested to have the work presented to them and appeals made for its support.

A finance committee was appointed: Mrs. William Lowell Putnam, chairman; Pres. K. L. Butterfield and Dr. E. H. Bigelow. The matter of finding a man who could give time and interest essential to act as treasurer, was brought up. Meeting was adjourned.

Paul W. Goldsbury, *Secretary*.

Since notification to President Butterfield of his selection as President, I have received the following from him, dated Amherst, May 7, 1921:

"My dear Dr. Goldsbury:—I want to help in the scheme proposed, but I can't accept the chairmanship of the committee. I have pledged myself, already, to all the work outside the administration of the college that I can possibly carry in justice to the college and myself, as well as the schemes undertaken. Somebody else must act as chairman. Yours very truly, (Signed) Kenyon L. Butterfield."

Since our meeting, also, communication has been had with Dr. F. E. Sampson of Creston, Iowa, and our next meeting will be planned during the week of the meeting of the American Medical Association, June 6-10, with a view to meeting with Dr. Sampson and taking up certain few important matters. Card will be sent out as to time and place of meeting, later.

Paul W. Goldsbury, *Secretary*.
Deerfield, May 17, 1921.

Mme. Curie's First American Contribution.—The July issue of the *Medical Review of Reviews* will contain a lengthy original contribution by Mme. Curie entitled "The Radio Elements and Their Applications." It is, we believe, the first and only contribution which this noted scientist has made to an American publication, and is extremely valuable. A copy of the July issue containing it will be sent gratis to any physician making the request.

Address, *The Medical Review of Reviews*, 51 East 59th Street, New York.

A Handy Little Reference Book.—Parke, Davis & Company recently issued a little reference book on Adrenalin that is conveniently arranged for ready consultation.

Adrenalin is the original natural preparation of the active principle of the suprarenal gland. It is a vastly better product than any synthetic compound, and under the present highly perfected process of manufacture it is a stable and dependable preparation of uniform strength.

## NOTES FROM DISTRICT SOCIETIES.

Dr. Edward W. Bartol has recently located in Lancaster to take the practice of the late Dr. Chester C. Beckley. Dr. Bartol has been elected to the Staff of the Clinton Hospital.

Dr. Edward B. Bigelow has resigned from his position as Supervisor of the Medical Service at the Worcester City Hospital and has accepted the position as Assistant Medical Director of the State Mutual Life Assurance Company. He retains his position as Visiting Physician to the Worcester City Hospital.

Dr. F. E. Garland, for the Health Committee of the Massachusetts State Medical Society, has been at the Worcester City Hospital during the past week, demonstrating the Schick Test. This is a part of a state-wide campaign undertaken by the committee to introduce this method of reducing the mortality in the state from diphtheria.

Dr. Homer Gage has been recently elected president of the Worcester Welfare Association.

Hampden District.—The Springfield Academy of Medicine held a special meeting Tuesday, May 24, 1921, and passed the following resolution: "We, the members of the Springfield Academy of Medicine, are familiar with the medical needs of this city, and hence are convinced that there is at the present time no need for a free medical dispensary. However, should future development reveal the need of some such agency, we are convinced that from the viewpoint both of public health and of civic economy, existing institutions should be utilized, rather than that an expensive duplication of plant and equipment be made an added charge upon the community."

The Junior Chamber of Commerce, the energetic offspring of the Springfield Chamber of Commerce, has been, with all the enthusiasm of youth, for some time agitating the opening of a free medical dispensary in Springfield. The agitation succeeded in eliciting the support of enough philanthropic individuals and charitable institutions to warrant a rather formidable organization of Junior Chamber of Commerce members bent on establishing such an institution. A definite plan was publicly presented, with estimates of the probable initial expense and annual cost of maintainance. A circular letter was sent to every physician in the city, soliciting not only approval of the project, but gratuitous service in the dispensary as well. A few favorable replies were received, but for the most part, physicians simply dropped the appeal in the waste basket. Much was publicly made, however of those few favorable replies, and the Junior Chamber of Commerce was about to go to the public for funds. This contemplated action brought about the special meeting of the Springfield Academy of Medicine, with results as stated. At the same time, the Directors of the Community Chest which collects and disburses funds for all the well organized and well conducted charities in the city, issued, after careful consideration, the statement that they did not endorse the project for a free medical dispensary, because they deemed it at present, extremely ill-advised. The agitation will probably, therefore, for the time being, be abandoned. Eventually, when the times are more propitious and when the need for such an institution is more clearly demonstrated, a compromise can be effected whereby the need will be met by establishing such an agency in connection with an already existing charity.

Allen G. Rice.

## BOSTON AND MASSACHUSETTS.

New England Surgical Society.—The next meeting of the New England Surgical Association will be held at Worcester, Massachusetts, on September 21 and 22, 1921. Headquarters, Hotel Bancroft. There will be clinics at the Worcester City Hospital, Memorial Hospital, and St. Vincent's Hospital on the morning of September 21st. After the reading of papers during the afternoon session, Doctor and Mrs. Homer Gage will entertain the members at tea at Shrewsbury. The second day will be devoted to a continuation of the scientific program. Members are invited to present contributions of their own selection, and are requested to notify the Secretary promptly, in order that the program may be completed as early as possible. The time allowed for the reading of papers shall be fifteen minutes, and five minutes for each speaker during the discussion, excepting invited guests. Members are requested to notify the Secretary, P. E. Truesdale, 151 Rock Street, Fall River, Mass., if lantern slides are to be shown.

Week's Death Rate in Boston.—During the week ending May 21, 1921, the number of deaths reported was 193 agaisst 239 last year, with a rate of 13.29 against 15.42 last year. There were 29 deaths under one year of age against 43 last year.

The number of cases of principal reportable diseases were: Diphtheria, 72; scarlet fever, 51; measles, 100; whooping cough, 15; typhoid fever, 5; tuberculosis, 54.

Included in the above, were the following cases of non-residents: Diphtheria, 9; scarlet fever, 4; measles, 1; whooping cough, 1; typhoid fever, 2; tuberculosis, 11.

Total deaths from these diseases were: Diphtheria, 5; scarlet fever, 2; measles, 1; tuberculosis, 13.

Included in the above, were the following cases of non-residents: Diphtheria, 3; tuberculosis, 2.

## NOTICES.

During the A. M. A. Convention the Medical School Building and Laboratories of Tufts College, located at 416 Huntington Avenue, will be open for inspection from 9 A.M. to 4 P.M. There will be exhibits of experimental work on focal infections in the Pathological Laboratory. The Departments of Physiology, Biological Chemistry and Histology will also present interesting material. A survey of the distribution of the graduates of medical schools, as affected by the attractions of urban *vs.* rural centres, will be shown.

Lecture Courses with Clinics for teachers, nurses, and physicians, relating to speech correction and development, will begin at the Northwestern University Summer School, June 27 and July 25, 1921. For particulars apply to Walter B. Swift, M.D., 110 Bay State Road, Boston

## RECENT DEATH.

Dr. Le Grand Blake, a Fellow of the Massachusetts Medical Society, died at his home, Riverside, R. I., April 22, 1921, aged 67 years. He was a graduate of Tufts Medical School in 1894.

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## Original Articles.

### THE TREATMENT OF CANCER.*

BY FREDERICK BRYANT, M.D., WORCESTER, MASS.,

*Consultant Roentgenologist to the Milford Hospital,*
*Assistant in Radiology in the Tufts Dental School.*

IT is a matter of great gratification to me to see so many of you present here tonight. The members of our profession are ever eager to learn, from those who have given special study to this baneful disease, what hope they can offer a cancer-cursed people. It is, and ever has been, the most to be feared of all diseases. Old as the Pyramids, both king and slave have felt its painful, nauseous, and deadly spell. It has been the most relentless foe of mankind. Other serious diseases have been rendered almost preventable and the race fears them no more; yet cancer continues to resist our efforts—increasing rather than decreasing. Its annual ravages in America and her possessions have reached the alarming figure of one hundred thousand, while it is conservatively estimated that fully five hundred thousand are today suffering its fiendish tortures. It is the most hopelessly protracted, bloody, stenchful, nauseous, loathsome, painful, incapacitating and ostracising of all diseases. It is the great impending danger and "the arch enemy of middle life and beyond," a time when the individual is of the greatest value to his community and home. It is the great black cloud which has obscured the light of hope from a countless procession of the untimely dead whose cry of pain and anguish has filled the earth.

Is there any silvery lining to this dark cancer cloud? Has any advance been made in cancer therapy during the past quarter of a century? We believe the anwser is decidedly in the affirmative. The past fifteen years of cancer study and investigation have yielded hopeful results to the end that we can no longer excuse ourselves for our inability to remedy this disease with the statement that no one knows anything about cancer. We do know several facts about cancer, and these facts give us wisdom, which we have never had before, for its prevention, treatment and cure. We are now able to consider cancer, by virtue of these facts, as a somewhat preventable and a somewhat curable disease. Cancer is no longer, therefore, an unknowable mystery. The hideous mask has been removed from this frightful phantom. From this accumulation of knowledge we are now able to fight this incarnate devourer of life with vital facts. What are these facts?

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* Read before the Middlesex East District Medical Society, Harvard Club, Boston, Mass., Oct. 20, 1920. This paper was presented as a report on the treatment of cancer at The Mayo Clinic.

We shall briefly tabulate these helpful facts under eight headings. There is a quibble over some of these facts, but the majority of cancer students has so pronounced, and the majority rules.

1. It has been established that cancer is neither hereditary, infectious, contagious or communicable. This has practical significance in life insurance. It directly aids the sufferer, for, no longer an object of danger, he is better cared for and is no longer subjected to leprous isolation and ostracism.

2. It is known that the age of greatest susceptibility or the so-called cancer zone is mid-life and on. This fact teaches us to watch most closely for cancer at this most susceptible age. There used to be an adage, in the medical school—*suspect syphilis.* But syphilis has a definite test and a specific cure, neither of which apply to cancer. Therefore it would seem wiser when the patient is in the cancer zone to suspect malignancy.

3. Cancer students are agreed that the local exciting cause of cancer is some form of chronic stimulative irritation, as, for example, the ragged tooth pricking the tongue. Detect and remove the irritation and the cancer does not appear. This fact teaches us that cancer is a preventable disease in so far as we may be able to learn to detect precancerous symptoms, or to remove precancerous irritations. In mouth cancer, the dentist is the master man, for "Good dentistry has eliminated a percentage of cancers of the jaw due to irritation of defective teeth." "We must spread more widely the knowledge that chronic irritation is the great underlying cause of the disease."

4. The conviction is well established that, at first, cancer is a local, or, at most, a regional disease which, if thoroughly removed while incipient or while local, a full and permanent recovery may be confidently expected. 'This fact emphasizes the time element; that prompt action may mean life; that delay is pretty sure to result in death; that here procastination is the thief of life; that in cancer it is the early whisperings of disease that are all important; that we should "treat the pathology of the living during the early stage of deviation from the normal physiological state." "Living pathology must hold a greater place in the surgeon's mind than the pathology which has been developed from the mortuary and has dominated medicine for the past generation."

5. Cancer in the different parts of the body has come to be regarded as an almost different disease, requiring different treatment and entailing a different prognosis. This fact indicates the vastness of the subject and the necessity of much study and experience to enable one to cope successfully with malignancy in its varied aspects and localities.

6. There is much evidence that certain constitutional predisposing conditions aid and abet the local exciting cause. Here we must take into responsible consideration, habits of life, modes of living, other diseases, and, in fact, any influence which tends to impair the individual resistance. This fact teaches the value of maintaining the highest degree of vigor during the cancer zone and the same principle applies to those already afflicted. It must also be borne in mind that some are more "resistant to cancer" than others.

7. It is evident that cancer increase keeps pace with modern civilization. There is a subtle combination of influences, in our modern ways of living, which increase the sources of chronic irritation. Peoples who live in a more primitive way and who are less exposed to the fads and fancies, dissipations, luxurious habits, strenuosities of thickly populated industrial city life are less afflicted. This fact teaches that the universal trend of modern civilization to city life is not unattended with cancer danger. "Whenever a certain type of cancer exists in a race of men or in a country with great frequency as compared with other races or countries, it is due to a single cause, usually a social custom." "It seems to be a well established fact that in the countries in which the breasts are allowed to remain exposed to the air without covering, cancer of the breast is extremely rare, and the incidence is in direct ratio to the amount of covering of the breast and the pressure exerted upon it." "The influence of drinks too hot to be held comfortably in the mouth in the production of chronic irritation which precedes the development of gastric cancer seems probable." We must place a suspicious attachment upon all forms of the use of tobacco. "Cancer of the lip and tongue is on the increase as the habit of smoking is on the increase in both sexes."

8. The eighth and last fact is given this position of importance because it carries great

possibilities in a curative way. The fact has been discovered, and well worked out, that the radiant energy of heat, the roentgen ray and radium have a destructive and a selectively destructive action upon the cancer cell. This is no longer a theory. This is the fact upon which the cancer therapy at the Mayo Clinic is based, and becomes, therefore, the burden of this report.

It seems most befitting to style this method of treatment as radio-surgical, as it is a combination of surgery and the various forms of radiation. This fact has been established in several medical centres of the world. It has been employed to some extent in many widely scattered clinics. American doctors have made successful use of it in private practice. The fact remains, however, that The Mayo Clinic has made the most complete, extensive and routine application of it. (Lantern slides of the Mayo Clinic.)

The employment of this radio-surgical method of cancer therapy must not be looked upon as a passing fancy. It was only adopted, as all the methods of this world-renowned clinic have been adopted, after due original research, careful investigation and painstaking consideration. When they had demonstrated to their own satisfaction that radiations did actually destroy malignant tissue, they accepted it with open minds and gave it practical employment.

This progressive spirit deeply impresses the visitor when, for the first time, he makes a pilgrimage to this surgical shrine. Here, men are studying to improve upon all that is already known, keen as detectives to note an error, unbiased as judges and, what we believe is a greater virtue, prompt and fearless as generals to act and put into actual practice the results of their discoveries. They are unhampered by conservative and restraining traditions. They have no traditions, for they are building up a unique medical unit on their own foundations. "The interpretation of facts constantly changes, the new interpretation of old and new facts are the sources of progress. Only as we are doubtful of our interpretation, can we hope to advance scientifically."

Is it not possible that this great clinic, which has no parallel in the world, is destined to still greater things? "We are lost in an endless vale of technic. Much valuable data has and is being accumulated, but it is confused, it lacks order and unification. There is a man coming presently who will lead us out into the light. He will give order, simplicity and uniformity to these many bewildering facts and complications. He will build his basis firmly on embryology, anatomy and physiology." May not these words spoken at the Mayo Clinic be prophetic of its great future in medicine? (Lantern slides illustrating the discovery and the biological action of radium.)

Radium has ever suffered from over-enthusiastic claims. It ran the gauntlet of a blundering stage of unscientific experimentation, relegated entirely to hopeless moribund cases, relegated to the extreme rear and only called upon in time of disastrous rout, and yet, in spite of these humiliating disqualifications, it gradually came back. Slowly but surely it began to prove its real worth. Today, as a result of three years of scientific application, in a variety of human ills in a narrow group of well-selected cases, where hardly any other remedy avails, it has taken the proud place in medicine is our greatest specific.

This discovery not only gave us a new therapeutic agency of a unique and peculiar value, but it gave scientists an entirely new conception of the composition of matter. It demonstrated a power of the atom undreamed of and almost beyond comprehension and belief. Here was an element practically indestructible yet possessed of almost unlimited energy, capable of firing out, as 1% of its output, thirty million projectiles per second with a velocity greater than that of light, each of which was found to pierce perceptibly a solid foot of iron. This introduced a new and unknown form of energy, namely, the energy of the atom or atomic energy. Heretofore all energy was supposed to reside in the molecule and molecular energy had been studied and was fairly well understood. The Mayo Clinic is already well under way in the study of atomic energy as a factor in cancer destruction. "Abstract sciences are being called to our aid, and scientific facts, apparently unrelated, are beginning to be understood in their relation to medicine. Much may be expected from bringing certain of the abstract sciences, especially physics, to the aid of biochemistry in giving us a better understanding of physiology and pathology."

We have three forms of radiant energy, all of which are made use of in the radio-surgical method, namely, heat, massive roentgen rays and radium. A comparison of these forms of energy is very necessary in attempting their application.

The radiant energy of heat is much the best known, due to the fact of its long study dating back to the beginning of physical and chemical science. It belongs to the forces of molecular energy, and as such, it has been pretty well understood. Its advent in medicine is not new. Since the discovery of germ life, it has played the leading rôle in disinfection. By its energy all dressings are prepared for operation and it has long been accepted as the best disposer of any contagious material. It has also been used in the actual destruction of malignant tissue for several years. Various cauteries and forms of heat have been devised, with water-cooled accessories, from time to time. It has been found that heat, in these forms of application, possessed some virtue in stopping much of the hemorrhage and malodor and seemed, for a time, to retard the malignant process, but on the whole it has not proved curative, and has never become a routine measure.

It is now beyond possible question that the cancer cell cannot endure or survive a degree of heat or radiation which has no ill effect upon the normal cell. The evil cell is a weakling from its embryonic nature. "We know of and have seen cases of well-marked malignant disease which have all at once disappeared without any apparent treatment whatsoever. In all these cases it is reasonable to suppose that the curative agency is heat. An inter-current disease, such as malaria or erysipelas, in which the fever reaches a high mark for a time, may have destroyed the malignant process."

Heat energy in its destruction possesses no selective ability. It destroys everything in its path, up to a certain line, and here it stops It has little or no penetrative power. In the radio-surgical treatment the cautery is used to destroy the gross mass of cancerous tissue down to its limits, if possible, for the reason that it gives less hemorrhage, less shock, and by its sealing action it is less liable to engraft or open up the lymphatics and blood vessels to cancer cell transplantation.

The radiant energies of the roentgen ray and radium are very similar, but they differ very widely from the radiant energy of heat, in that they have no germicidal action. The former can be made to burn the tissues somewhat like the cautery, but they possess this striking and all important difference in that while they do possess a destructive ability they can be so applied by a system of filtration that they also possess a selectively destructive ability. This fact enables the operator to save the skin and yet dip down beneath the skin and pick out the malignant cells from among the normal tissues. Beyond a self-limiting line of coagulation necrosis the radiations of heat do not penetrate and here its usefulness ends. Where the energy of heat ends, the energy of the roentgen ray and radium begins. The latter by virtue of their atomic explosive energy send cancer destructive bombardments deep into the tissues.

Much investigation and argumentation have taken place regarding the similarity of these two radiations. While much alike, it has been noted that radium is the more penetrating and more intense but less extensive. The roentgen ray covers large surfaces, while radium is limited to point contact and is best suited to work inside rather than upon the tissues. It has been noted by those who have used both agencies that the burns produced by each differ. The radium burn heals slowly, but without pain, and is in no way considered a matter of great moment, while the burn from the roentgen ray almost never heals, is exquisitely painful, and is an accident to be dreaded.

"It has been found that these two radiative energies act upon the malignant cell. Radium attacks the nucleus of the cell, while the roentgen ray acts upon the various cell structures pretty much alike. Now it has been established that the nucleus of the cancer cell is the heart of the cell life. Destroy this and the cell dies. But what is equally important, the nucleus, with its accompanying centrosomes, regulates and initiates the reproduction function of the cell. Here procreation takes place through a complicated biological mechanism. To destroy the cell by radiation, you must destroy the nucleus. To inhibit or temporarily prevent reproduction, you must reach the nucleus with an inhibitive dose of radiative energy. Radium either destroys the cell or inhibits its reproduction by its selective specific action upon the nucleus and its satellite centrosomes. The roentgen ray, on the other hand, acts equally upon the nucleus, the protoplasm, the cystoplasm and the centrosomes. If it is applied in light stimulating or irritating doses covering a long time and it is not powerful or massive enough to accomplish the actual destruction of the cell nucleus, it may act as a chronic stimulative irritation and serve to derange or upset the community life of the cell and cause the centrosomes to start on a mad career of procreative activity and cancerous tissue production. This fact has been demonstrated over and over again, on the hands of roentgen ray operators who worked without protection. This fact has become a sound argument for the irritation theory as the local exciting cause of cancer. So far as is known, radium, unlike the x-ray, has never caused cancer because of its specific nuclear action."

Let us now note the practical application of this radiative knowledge to the treatment of cancer. Three claims are made for its use by those who have had experience with it. "By properly combining radiotherapy with surgery, *we can increase operability, lower mortality,* and *increase percentage of cures.*" "Radiotherapy destroys cells for a certain distance, but cells are sterilized at a greater distance so that their reproduction is checked, and connective tissue is caused to develop, which acts as a barrier to the further extension of the malignant process." Radiotherapy, whether applied as radium, x-ray, or heat, sickens malignant cells beyond the area of destruction. During this period of cell sickness their resistance is reduced and procreation is less efficient, but operation should not be delayed after radiotherapy, since the period of increased cell vulnerability is short and the connective-tissue development which interferes with subsequent operation is rapid. This indicates the desirability of anti-operative radiation to "prepare the cancer field for operation, and as after treatment to reduce the percentage of recurrences."

The application of radiations should be thorough and extensive, going out far afield of the growth along the line of the lymphatic drainage or paths of metastasis. The innocent lymphatics should be sclerosed and fibrosis promoted as a wall of protection to the subsequent attempt of malignant invasion during or following operation. "Malignancy is the property of the cell; the stroma is not a part of the neoplasm, but is a measure of nature's defense." "Undoubtedly a large proportion of cancer cells are destroyed by the defense cells of the body; of these the fibrous connective tissue cell is the most important, since it cuts off nourishment from the cancer cell." "Malignant cells will sometimes be found capsulated in the tissues of an operative field from which a malignant neoplasm has been removed. Occasionally through some agency, such as traumatism or general disease, the retaining wall breaks down, and metastasis occurs after many years of apparent operative cure." There is, therefore, every argument to create as much fibrous connective tissue as possible, in and about the operative field.

Radiations preceding the operation serve to extend operability by assisting the surgeon to remove all the malignant cells in doubtful or border-line cases. It is these border-line cases of malignancy which have yielded exceedingly poor operative results. Surgeons are more and more reluctant to incise a malignant growth where it is a question whether it can be completely removed or not, for fear of converting a local into a general disaster. Radiation assists the surgeon in two ways in this otherwise hopeless field; by temporarily rendering the tumor mass inert so that the transplantation of any cancer cells will not be attended with grafting in other localities; and by reaching with destructive rays or capsulating in fibrous tissue any cells left behind. "I have been impressed with the fact that too little attention has been paid to traumatic transplantation of malignant cells during operation. Rough handling of the growth loosens cells which may become grafted on any surface denuded of its normal covering."

"In our early cases of vaginal hysterectomy for cancer of the cervix we rarely had a cure. The carcinomatous cervix was grasped with vulsellum forceps, traumatizing the tissues during the removal of the growth, and local recurrence resulted. We then began doing all vaginal hysterectomies with the cautery knife and many five-year cures were obtained. The cautery method has a field of usefulness in selected cases. We found that the excessive dilatation of the vagina, preliminary to the use of the cautery, made many fissures in the vaginal mucosa. In two of our cases carcinoma developed in these vaginal fissures from cells deposited there, although there was no recurrence at the site of the original neoplasm."

For one year past, the radio-surgical method has been employed in these cases. Radium has been applied to the cervix for full dosage. An hysterectomy follows within a week of the last treatment. This gives the radiations sufficient time to sicken the evil cells without incurring the formation of fibrous tissue which would in any way interfere with the operation. The operation is followed by another full radium dosage to the vaginal vault either to the cervical stump or to the sutured area.

The claims for this method of treatment are: that in ninety-six consecutive cases dating back one year, there has been no mortality, while the year before, for the same cases, the mortality was twenty per cent.; that radium, at the cervix, penetrates further than the knife can go; that this amount of radium in the pelvis not only sickens the malignant cells and prevents traumatic transplantation during the operation, but that after operation it destroys any cells left behind, either directly or by the creation of a large amount of the hardest kind of fibrous tissue accomplish their permanent capsulation; that by the use of radium the most extensive operation is done without shock, for radium does the deep dissections; that no operative mortality attends this method.

While no authoritative statement can be made at this time, yet there are many rumors that radium, before many years, will displace operative procedures in cancer of the cervix in all stages of the disease. Some leading gynecologists are pretty well convinced that when you consider the results obtained by radium and surgery, the small disturbance of one and the shock and danger of immediate mortality of the other, the one requiring a protracted absence from home and an operative skill far in excess of the other, the one almost never contra-indicated, the one frequently administered without an anesthetic, that the simpler remedy is, in time, destined to become the one of choice.

The same general method obtains in the radio-surgical treatment of cancer of the rectum. As far as time permits a judgment less recurrences are in evidence. In all these situations while radium is being used, internally both before and following the operation, the roentgen ray is applied externally in massive doses.

Where any severing of the tissues, in and about the cancerous area is necessary the cautery is used rather than the knife to avoid transplantation of the cancerous cells. The cautery finds large employment in the cancer of the antrum of Highmore. The cheek and tongue being retracted, the cautery, in the form of a small soldering iron, enters the antrum at the place where the cancer points. All the carcinomatous tissue is cooked away with a dull prolonged heat. Radium is placed on the base of the cavity thus established. This method of treatment is preferred to a resection of the superior maxilla because there is less hemorrhage, less shock, and less recurrence. (Lantern slides illustrating the use of the cautery.)

Radium is the agency of choice in cancers of the face which are not too large, old, nor extensive. The cosmetic results are delightful, while a disfiguring operation, in this region, offers no advantage in being able to prevent recurrences.

The employment of radiation is amply justified by its palliative possibilities, if for no other. It was in this hopeless field that radium won its way back to favor. We cannot neglect or refuse to treat hopeless incurable sufferers. We cannot expose them to die on the hillside, as in olden days. In some cases of cancer of the breast and uterus palliative radiation accomplishes excellent results in not only checking hemorrhage, discharge and pain with the prolongation of life, but also rescuing a small percentage to recovery.

In conclusion, we believe that the treatment of malignancy deserves to be classed as one of our modern specialties. Its duty is not only to urge the profession to act promptly, but to make the lay man intelligent to pre- and early cancer symptoms. He who would succeed best must wisely combine all the agencies which have proved therapeutically effectual. Each method by itself alone has failed. The coöperative combination of the radiologist and the surgeon is our greatest hope for the present and the future. He who adheres tenaciously to any one remedy and loses sight of the others will fall short of the best possibilities. The surgeon who does not see his radiative possibilities and the radio-therapist who does not realize his surgical opportunity will equally fail. To this end the radio-therapist seeks the good-will and confidence of the surgeon, disclaiming any attempt or desire to usurp any of his well-earned prerogatives but rather offering radiation as his handmaid to render the work of his hand more permanent and curative. The radio-therapist does not seek to lessen the number of surgical operations, but rather to increase them by extending operability. The open-minded surgeon welcomes this reinforcement, for there is proof enough already that it decreases mortality and recurrences, and relieves him partially or completely of the responsibility in a most trying and unsatisfactory line of cases.

The radio-therapist stands ready to aid the surgeon in radio-surgical method, as outlined above, in operable cases. He also stands ready to administer radiations, in a palliative way, in hopeless inoperable cases or in recurrences where the knife has failed and can do no more. This latter class will yield a frightful mortality if he heeds the cry of a suffering humanity rather than his own personal ambitions in tabulated recoveries.

Radium heresy from professional sources is not uncommonly heard: that it has no therapeutic value; that cases have been made worse by its use; that it is only another of the many "cancer cures" which have flooded the earth; and that it will, like similar ventures, have its little day and cease to be. These unjust and unwarranted conclusions are based on three facts: radium gossip, a case where radium has failed, and no knowledge of radium. Radium gossip, like street gossip, does not stand in a court of justice. In the prejudiced mind the unfortunate case seems never to be forgotten, while brilliant results pass unnoticed. If an appendectomy fails, do we condemn the operation? It is a discouraging fact and one to be deprecated that those who have gained merited distinction in other fields of medical endeavor, whose opinions, therefore, carry great weight, often express themselves freely on another departure with which they have had no practical experience. Not one radium investigator, the world over, can be found who will substantiate in the slightest degree these meritless conclusions.

If radium possesses no therapeutic value, why is it that a large number of medical men, including not a few who have attained eminence in surgery, medicine, pathology and gynecology, are devoting themselves to its use? The Radium Society of America is six years old. It is officered by leading medical men. Has any "cancer cure" before ever gained such a permanently organized following? If radium is a fleeting "cancer cure," here today and gone tomorrow, how is it that at the end of half a score of years of use we find it winning better and better reports throughout the world? Was there ever a "cancer cure" before, that held its place thus long, with ever-increasing value? Was there ever a "cancer cure" before, based on the greatest physical discovery of the ages? If there is any uncertainty as to the therapeutic value of radium, why do we find our large American clinics expending millions to possess it? One of our state legislatures has, within the year, passed a bill appropriating two hundred thousand dollars for the purchase of radium. This indicates that sufficient scientific and medical evidence of its worth was brought to bear upon that body of laymen till they were convinced that a suffering humanity would be served by their act. Was there ever a time when a "cancer cure" was purchased by a state or at such a price?

If this defensive argument is unsound, why is it that the clinic under discussion, an institution which is leading surgical thought throughout the world, an institution whose deductions and teachings have been followed by our American surgeons, an institution to which many of our profession have gone for treatment themselves, has purchased vast holdings of radium and prescribe its use as the handmaid of surgery in all forms of malignancy? Sufficient evidence, therefore, is at hand to abundantly substantiate the fact that radiative therapy is here to stay in combination with surgery. "Radio-active substances give great promise for the future." He who resists it resists progress, and he who resists progress handicaps his ability to do for those who look to him for help.

### Bibliography.

Mayo, W. J., M.D., F.A.C.S., Rochester, Minn.: "The Relation of Cancer to the Prolongation of Human Life." Surg., Gyn., and Obstet., January, 1920, pp. 22-26.

Mayo, W. J., M.D., F.A.C.S., Rochester, Minn.: "Gastric Ulcer." Jour. A. M. A., Sept. 25, 1915.

Mayo, W. J., M.D., F.A.C.S., Rochester, Minn.: "Relation of Development of the Gastro-Intestinal Tract to Abdominal Surgery." Jour. A. M. A., Feb. 7, 1920.

New, G. B., M.D., Rochester, Minn.: "Radium in the Treatment of Lymphangioma of the Tongue." The Journal-Lancet, Nov. 1, 1916.

New, G. B., M.D., Rochester, Minn.: "Treatment of Malignant Tumors of the Antrum."

New, G. B., M.D., Rochester, Minn.: "The Use of Heat and Radium in the Treatment of Cancer of the Cheeks and Jaws." Jour. A. M. A., Oct. 26, 1920.

New, G. B., M.D., Rochester, Minn.: "Radium in the Treatment of Diseases of the Eye and Adnexia." Am. Jour. of Ophth., Vol. iii, No. 4, April, 1920.

New, G. B., M.D., Rochester, Minn.: "Mixed Tumors of the Throat, Mouth and Face," Jour. A. M. A., Sept. 11, 1920.

Notes taken at The Mayo Clinic, September 6 to 15, 1920, by the writer, on unpublished discussions.

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Under the Program of Clinics, published June 2, under the subdivision, Massachusetts General Hospital, the date, October 16, 1848, should have read October 16, 1846.

# THE TREATMENT OF TUMORS BY X-RAYS AND RADIUM.*

By Robert B. Greenough, M.D., Boston.

In making this brief communication upon the treatment of tumors with x-rays and radium, I would first express to you my thanks for the privilege accorded me of presenting a report before this eminent society of surgeons.

While the subject is one of the greatest intrest to the surgical world, it is one to which few surgeons of wide operative experience have given much of their personal attention, and the therapeutic use of radium and x-rays has been carried out chiefly by physicians and institutions devoted primarily to radio-therapy. My own experience has had to do more particularly with radium than with x-rays, and dates only from 1912, when we first obtained radium in Boston in quantity sufficient to engage in a serious investigation of its effects upon tumor growth.

The institution which I represent—the Cancer Commission of Harvard University—was so fortunate as to secure at that time the services of Professor William Duane, a physicist who had worked for some years under M. and Mme. Curie in Paris, where he had made himself familiar with the subject of radio-activity and had contributed by his investigations to the knowledge of that subject. Under Professor Duane's guidance, and with the coöperation of Dr. W. T. Bovie, who has been working for our Commission in the field of research between Biology and Physics, the attempt was made to apply to the actual treatment of patients the physical principles of radio-activity, which had been established, and to carry on further investigations both in the laboratory and in the clinic, with a view to determining the most effective methods of employment of these powerful and beneficent agents.

Our knowledge of the physics and chemistry of radium far exceeds in accuracy our knowledge of its biological effects, for the reason that our knowledge of biology, so far as the ultimate composition and physiology of cell protoplasm is concerned, is chiefly theoretical. Whatever theory of protoplasmic structure we accept, however, it can be said that as a result of the exposure to radiations of x-rays, or radium, changes occur in living tissues which are at first invisible and unappreciated by our coarse methods of observation, but which later manifest themselves by certain phenomena varying from a modification of growth, either in rapidity or form, to the death and destruction of the cells or tissues involved.

The term *reaction*, or *radium reaction*, has been widely used to express the phenomena following radiation. The comparison is aptly made to the exposure of the sensitive photographic plate, whereby changes occur in the silver salts as a result of radiation. These changes in the silver emulsion, however, are not to be detected by our ordinary methods of observation, until a further chemical reaction, the process of development, brings the latent image into view. Whether the changes occurring in the photographic plate and those occurring in living cells by exposure to radiation are of one and the same nature is a matter of further investigation. It has been held that a process similar to, if not identical with, the ionization of gases may be the means by which these changes in the finer physico-chemical composition of the sensitive film or of the tissue cells are brought about, but much further investigation is needed upon this subject.

Again, the conditions controlling the process of development of the latent effects of radiation on the living cell are quite unknown. Some experiments of Dr. Bovie[1] would indicate that slight variations of temperature suffice to make these changes manifest, and doubtless other agents, such as the chemical changes of anabolism and katobolism perhaps might serve as accelerators or retarders of development in the living tissue. The subject is one of great complexity, because we realize that we are forced to use rays of several different characters when dealing with x-rays and radium. The alpha, beta and gamma rays of radium, the hard and soft x-rays, and the secondary radiations produced by the absorption of x-rays and gamma rays in objects of different composition in their path differ in their powers of penetration, and also in their quantity and in their physical qualities as well. The effects upon living tissues of the different types of rays have been the subject of much investigation, but, as yet, we are only upon the threshold of our knowledge of this subject. It may, however, be accepted as a fact that rays which are not absorbed produce little if any effect upon the tissues through which they pass, and that the penetration of the different rays through tissues of uniform density follows a definite physical law.

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* Read by title at the Fifth Congress of the International Surgical Society, Paris, July, 1920.

As regards the tissues themselves we recognize that differences in susceptibility to radiation exist, such that cells of one kind, as the germ cells of the testicle, are apparently affected far more seriously by a given length and quality of exposure than are the cells of another character, such as those of the external skin. In fact, it is not unreasonable to suppose that the external skin, by adaptation, has acquired or developed a degree of susceptibility to the effects of radiation in the long process of adaptation of men and animals to their environment.

There is good reason to believe, also, that there are certain periods in the life cycle of a single cell when it is more susceptible than at other periods, and it is held that cells undergoing nuclear division are especially vulnerable to the effects of radiation.[2] The law of Bergonié and Tribondeau[3] states that immature cells and cells in an active state of division are more sensitive to radiation (x-rays) than are cells which have already acquired their fixed adult morphological or physiological characters. This law is based upon studies made with x-rays upon the testicle of the rat. It must be remembered, however, that our methods of investigation enable us to detect alterations in cells which are in an active state of division more readily than in cells which have acquired their fixed adult morphological and physiological characters. Redfield,[4] however, obtained very pronounced changes in the fertilization membrane of the Nereis egg by exposures far below that required to produce changes in subsequent processes of mitosis.

In the treatment of tumors by radiation the specific sensitiveness of certain tissues has assumed a very important place. It has been stated, for instance,[5] that "certain types of cancer-cell will be affected four to seven times more readily than healthy cells." An accurate comparison of this sort is extremely difficult to make, as we have no satisfactory standards for measurement, and it would seem to be safer, in our present state of knowledge, to confine our estimates of the comparative degrees of sensitiveness of cells to phenomena which can be measured in the laboratory.

By many experiments it has been established that exposure to radiation is capable of causing the death *en masse* of tissues of varying cellular composition. This may be called the "massive destructive" effect of radium, and it can be demonstrated on plants or animals. Animal tissues are composed of cells of many different varieties, and when a *mass* of tissue is destroyed the cells of all of those varieties die; the dead tissue is separated from the living cells about it (demarcation) and is discharged as a slough or sequestrum. Thus in a severe radium or x-ray burn of the skin the epithelial cells of the epidermis and of the hair follicles and sweat glands, the cells of the corium, the blood vessels, nerves and lymphatics, and those of the subcutaneous fat and fibrous tissue all die, and are cast off, leaving an ulcer lined with granulation tissue, and notoriously slow to heal.

It is well within the bounds of possibility that certain more sensitive types of cells may be destroyed by direct radiation over an area wider than that in which massive destruction occurs of all of the affected cells which compose the tissue radiated. In this wider area, the more resistant cells, such as those of the connective tissues, are not destroyed but are excited to a more vigorous growth. This possibility is borne out by clinical observation for it is well recognized that a radium, or x-ray burn is slower to heal than a burn produced by an ordinary cautery, and the pronounced scar tissue growth surrounding the area of massive destruction and slough is the most pronounced characteristic of the radium or x-ray burn.

There is usually a "latent" period of longer or shorter duration before the results of radiation are manifest. Changes in the electrical conductivity of tissues occur more promptly than do the gross changes of cytolysis or degeneration, but in any case the tissues exposed die, and according to the importance of those tissues to the individual, the individual dies, or sets about the normal processes for the demarcation and extrusion of the damaged tissue and the repair of the defect.

When the exposure to radiation is insufficient to cause the massive destruction of tissues other effects are observed. Protozoa exposed to mild doses of radiation display an inhibition of the phenomenon of cell division lasting for variable periods of time.[6] After this period of inhibition has elapsed, recovery may take place and the cells begin to divide again, and in some cases at a more rapid rate than before radiation, so that ultimately the total growth from the radiated cells may exceed in number the growth derived from the unradiated controls. Here we see what can be described only as phenomena of inhibition and of stimulation.

In other experiments, cells of embryonic character (tadpoles)[7] exposed to radiation showed temporary arrest of growth with subsequent development into abnormal forms (monsters). This is an example of a modification of growth differing somewhat from either of the first two described effects, though possibly dependent on a combination of inhibition and stimulation.

While admitting that our methods of observation are far too crude to permit any but the broadest generalization, we may say that, as a result of radiation (1) living tissue may be destroyed *en masse;* (2) growth may be temporarily inhibited; (3) rapidity of growth may be stimulated, and (4) the manner of growth may be modified. In the terms of these four phenomena we must consider the action of radiation in the treatment of disease.

While the massive destruction of a complex tissue demands a dose of radiation sufficient to kill the cells of all of the different types of the area involved, it must be borne in mind that the effects of stimulation, inhibition and modification of growth may be exerted upon individual types of cells in the tissue area exposed to radiation, depending upon the dosage, the susceptibility of the cells to radiation, and doubtless upon many other factors of which we have at present insufficient knowledge. We must remember, too, that for the treatment of non-malignant diseases, and for the palliative (non-curative) treatment of cancer, all of the cells exposed to radiation need not be destroyed. Satisfactory results may well be produced if only fifty or seventy-five per cent. of the growing cells are affected by the exposure. If we are to cure cancer, however, by radiation, the exposure must be shown to be one hundred per cent. efficient in destroying the disease, or recurrence is to be expected.

In the practical application of radiotherapy to the treatment of tumors, the mass destructive effect of a lethal dose of radiation is frequently employed. Superficial non-metastasizing carcinomata of the skin of both the squamous and the basal-cell variety are often completely destroyed by this use of radium. The destructive effects of radium are employed also in the treatment of some of the metastasizing forms of cancer, in situations where the operative removal of the tumor is for one or another reason impracticable or impossible. Here the insertion method by the use of bare tubes of emanation, or the needles holding radium salts or emanation at their tips, has proved effective in producing the death *en masse* of the tumor tissue. These measures can be employed with safety, however, only in situations where the location of the tumor tissue on the surface of the body permits the normal suppurative processes for the separation of the necrotic tissues and their discharge to take place without the risk of deep and dangerous infection. While many attempts have been made to bury tubes of emanation in the substance of deeply situated tumors, such as brain tumors or sarcomata of different varieties, in our experience either the dosage has been so small as to be ineffective, or a degenerative process has resulted with secondary infection such that an opening to the surface for drainage was made necessary. For the treatment of certain malignant tumors on the surface of the body when operative removal of the tumor is impossible, or in combination with operation when operative removal alone is insufficient, the use of the massive destructive action of radium, by the method of the insertion of tubes of emanation, finds a field of the greatest usefulness.

Since it is the absorbed rays rather than the penetrating rays which produce the greatest effects on living tissues, it is probable that the beta rays are the ones which are most concerned in producing massive destruction by the use of radium. For this same reason massive destruction is produced only in close proximity to the source of radiation, and the filtration of the tumor tissue itself protects the more distant portions of the growth from deleterious effects. In our own experience with a dosage of fifteen millicuries of radium emanation inserted in a tumor mass in a bare glass tube, and allowed to remain in place for an indefinite period of time until the emanation has decayed, a massive destructive effect has rarely been obtained at a distance of more than one centimeter from the source of radiation.

Inhibition of growth: The phenomenon of temporary inhibition of growth is observed alike in the laboratory and in the clinic. Without gross changes in the appearance of the tissue, cells exposed to radiation may remain quiescent for a considerable period of time, only to wake to active and continued growth after the radium effects have passed away. In the clinic this phenomenon appears as the recurrence of a tumor apparently destroyed by radium treatment.

While we cannot establish any definite limit to the duration of this phenomenon of inhibition of growth we must believe, from our observations of recurrence of cancer after radium treatment and after operation, that a very long time may elapse—in some cases several years—before cancer cells of certain types resume their activity and attain a sufficient growth to permit clinical recognition as a recurrence of the disease. It must be accepted as a positive fact, however, that radiation can retard or inhibit growth for a considerable period of time.

It is now generally conceded that small doses of radiation produce a stimulant effect on growth. This is in accord with the general physiological principle that a small dose of a destructive or paralyzing drug or agent has a stimulating effect, and it has been demonstrated in the laboratories both in relation to plants and to animal tissues.

The exact nature of the change which takes place in the tissue cell as a result of radiation and which results in a subsequently increased rapidity of growth, is quite unknown to us. We must admit, however, that it is most improbable that one dose of radiation should contribute a constituent of growth which was previously lacking, as would be the case if a plant or animal were supplied with a greater quantity of light, heat or moisture. On the contrary, the primary inhibition of growth followed by the later increased rapidity of cell division would appear to justify the assumption that damage was done to some part of the cell mechanism by the radiation, and that as a result of this damage the normal (protective) processes in response to injury were excited and repair begun. It is well known that nature's efforts at repair often exceed in their amount the actual defect.

Certain observers[8] go so far as to maintain that the effect of stimulation by radiation is sufficient in actual experiment to lead to the production of cancer, and cite the development of cancer in x-ray lesions in support of this assertion. While we have not a sufficient knowledge as yet of the reasons for, and of the stages of the development of x-ray cancer, many observers believe that x-ray cancer is a result of the long-continued and slowly healing x-ray burn, and of nature's efforts to repair this defect, rather than a specific late effect of the radiation of the epithelial cells themselves.

There is another aspect of the effects of radium when used in the treatment of tumors which is of some importance, and that is the effect exerted on the normal tissues surrounding the area of disease. A sufficient number of observations have been recorded to make it certain that changes in the blood vessels and in the connective tissues in the way of a new growth of cell elements are the earliest observable histological changes after radiation. How much of this change is primarily the result of the radiation of the connective tissue cells themselves, and how much due to the natural process of inflammation and repair excited by the presence of the damaged tumor tissue, it is impossible to state. It is of note, however, that a marked new growth of connective tissue elements occurs before any recognizable change in the epithelial cells makes its appearance. In the clinic we have an example of this effect upon connective tissue growth, in the diffuse fibrous tissue formation found at operation in the exposed area after prolonged x-ray or radium treatment. It is to this cause that surgeons attribute the well-known tendency to diffuse capillary hemorrhage and the lowered resistance against infection which is shown in cases of this character when subjected to secondary operation.

It has been well said that the ideal use of radium for the treatment of a tumor would be obtained if we could thrust into the middle of the tumor an amount of radium sufficient to destroy the tumor tissue completely, and at the same time to stimulate the surrounding connective tissues of the host to active proliferation such that the area became walled off by a dense fibrous tissue barrier. While admittedly a matter largely of theory, there are competent observers who attribute much of the so-called retarding effect of radiation upon deep tumors to the stimulating effects upon the surrounding connective tissue rather than to the destructive or inhibiting effects of radiation upon the tumor cells themselves.

The modifications of growth which result from the radiation of living cells depend to a great extent upon the nature of the tissue investigated. Thus normal tissues may be made abnormal, and developing embryonic cells may be made to develop in an abnormal way even to the extent of the production of monsters. In the clinic, the ability of radiation to modify the growth of cells is shown in the application of radiotherapy to the relief of benign lesions of the skin, such as papillomas and keratoses. In these cases the destructive effects of radiation are not needed or desired. After a mild reaction the deeper cells of the epidermis which have previously been growing in an abnormal manner, begin to grow in a more normal manner; the abnormal cells are cast off and the lesion is cured without a scar. It is this peculiar and but little understood action of radiation that has led to some of the misunderstanding of the limitations of radiotherapy, for this action, while of the greatest value in the treatment of non-malignant lesions, can be counted upon but little in the attempt to eradicate malignant disease. No modification of growth of cancer cells short of death and destruction of every cell is sufficient to cure the patient of cancer. In cancer we find epithelial cells infiltrating the tissues at a distance from their normal situation. It is by this criterion rather than by the cell morphology that we recognize the disease, and no matter how extensively their growth is modified, so long as cancer cells are living and capable of subsequent further cell-division and growth in their abnormal situation, the patient is not cured of his disease. There is thus a very definite limitation to the possible employment of the modifying or alterative effect of radiation in the cure of cancer, and however valuable the effects of radiation may be in inhibiting or retarding the growth of cancer cells in palliative treatment, it is the destructive effect which must be obtained if we seek to cure the disease.

We must now consider the so-called "selective action" of radium upon tumor tissue. It is true that some of the benign lesions, like papillomas and keratoses, which yield to the "modifying" effect of radium, without a destructive effect, are of the class of so-called precancerous lesions, but this does not give us reason to presuppose a similar reaction when dealing with cancer tissue. It is also true that variation in the sensitiveness of different tissues to radiation is a well-established fact. It is generally recognized that the lymph adenoid tissues and those of the ovary and testicle are especially sensitive to radiation. With these considerations in mind let us judge whether the actual experience in the clinic bears out the supposition that cancer tissue has a specific sensitiveness to radiation.

Certain tumors of lymph-adenoid tissue, such as malignant lymphoma (Hodgkin's disease) and lympho-sarcoma appear to exhibit a definite and positive sensitiveness to radiation in that when they are for the first time subjected to deep radiation profound changes in their structure take place—the tumor masses shrink and occasionally disappear, without undue damage to the normal tissues overlying the disease. In our experiences these changes are temporary rather than permanent, and although a recurrence of the tumor masses in the same or in other lymph-nodes may again react favorably to radiation, sooner or later the sensitiveness is lost, and the patient ultimately succumbs to the disease. In myeloid leukaemia, also, profound changes in the blood picture, in the size of the spleen, and in the patient's comfort result from deep radiation of the spleen; but, again, the improvement is temporary and is followed by recurrence of symptoms and ultimately death. These two diseases, although of a fatal character, are not really comparable to carcinoma but they are often invoked as evidence of a selective action of radium. This action, however, is one of modification of growth or even possibly of stimulation of certain types of tissue, rather than of a destructive effect, and the beneficial effects of treatment in both of these conditions are, as a rule, temporary—the disease is not cured.

The cells of the ovary and of the testicle are, again, notoriously susceptible to radiation. This subject has been studied more in relation to the x-ray than in relation to radium, but it is well known that ovarian function and menstruation can be brought to an end by intrauterine applications of radium, and with all the symptoms of the menopause. The condition of azoöspermia has also frequently been found in male x-ray workers, although there is reason to believe that recovery from this condition may subsequently occur when exposure ceases.

When cancer is superficial and accessible to direct radiation of any desired dosage either by surface applicators or by insertions, it can often be permanently destroyed. In no case of actual cancer, however, have we succeeded in this purpose without the production of a destructive lesion, and in many cases we fail to destroy the disease entirely, and at some subsequent time the disease recurs. In some cases, indeed, as when a basal-cell carcinoma involves the bones of the face, or a carcinoma of the tongue extends into the tissues of the floor of the mouth, the cancer tissue appears to be more resistant to radiation than the normal tissues in its vicinity. In these cases, at least, no specific sensitiveness is manifest.

Advanced cases of cancer of squamous-celled or glandular origin which have extended to the regional lymph-nodes are frequently subjected to treatment with radium. The extension of carcinoma to the regional lymph-nodes is a familiar occurrence, and the enlargement of these nodes is commonly accepted as evidence of this extension having taken place. We must not forget, however, that other causes for enlargement of lymph-nodes exist, and it is not at all uncommon to see an inflammatory process in the regional lymph-nodes due to the ulceration of a primary carcinoma. Even in the presence of a certain amount of infiltration with cancer cells, inflammatory changes may occur and lead to fluctuations in the size of lymph-nodes far too rapid to be interpreted as due to cancer growth alone. In almost every fatal case of carcinoma of squamous-celled or glandular origin, extension of the disease to the regional lymph-nodes ultimately takes place. We have given radium treatment in a very large number of these cases, but in no case have we succeeded in destroying, permanently, the disease. It is true that shrinkage in size of an enlarged node is occasionally observed, but we are inclined to attribute this, when it occurs, to a change in the accompanying inflammatory process rather than to a destruction of cancer tissue. As a result of prolonged radium or x-ray treatment, areas of glandular involvement may further show a diffuse thickening of the surrounding connective tissues, and we have thought that a retardation of the progress of the disease may have occurred, but we have yet to see the permanent cure of any such case, and such improvement as is manifest may well be due in part, at least, to the stimulating effects of radiation on connective tissue growth rather than to any specific destructive effect on cancer tissue.

We have seen that cells engaged in mitotic cell division are generally believed to be more sensitive to radiation than resting cells. One of the characteristics of cancer tissue is the large number of mitotic figures present, as well as the fact that many of these mitoses are of an irregular or atypical character. The number of mitotic figures is indeed accepted as a rough indication of the rapidity of growth of a given tumor, and thus an index of its degree of malignancy. Unfortunately, we have little accurate knowledge of the amount of time consumed in a mitotic cell-division in cancer tissue in the body, but it is not unreasonable to suppose that a part, if not the greatest part, of the supposed sensitiveness of cancer tissue to radiation is dependent upon the number of cells actually undergoing mitosis during the period of exposure. If this is so, a fractional destruction of the tumor only can be expected as a result of repeated deep radiation, for during each exposure only those cells in mitosis would be affected, and a diminishing but constant residue of unaffected cells would always remain to wake into activity and grow at some subsequent time, and produce recurrence. We must also recognize that there is abundant evidence that repeated exposures to radiation produce a gradual loss of sensitiveness on the part of the tissues exposed, so that the attempt to accomplish a fractional destruction of tumor tissue by deep radiation is by this fact, also, made more difficult. The clinical observations of the results of deep radiation on cancer tissue are in accord with this theory, for although inhibition or retardation of growth may be observed, the destruction of the tumor and the cure of the disease are not accomplished.

In general, we may say that experience in the clinic and in the laboratory has shown that the massive destruction effect of radiation (by direct application) is necessary for the cure of malignant disease.

While certain tissues show a sensitiveness to deep radiation, which is of value in the treatment of non-malignant diseases, and in the palliative (non-curative) treatment of malignant disease as well, the cure of cancer (estimated in surgical terms on a three- or five-year basis) is not accomplished without massive and total destruction of the tumor by direct application of the source of radio-activity.

### REFERENCES.

[1] Bovie, W. T. (Boston): Journal of General Physiology, Vol. i, No. 3, pp. 331-336, January 20, 1919.

[2] Mottram, J. C. (London): Archives of the Middlesex Hospital, Cancer Report, 1913.

[3] Bergonié, J., and Tribondeau, L.: Comptes rendus Société de Biologie, Vol. lvii, p. 400, 1904.

[4] Redfield, A. C., and Bright, E. M. (Boston): American Journal of Physiology, Vol. xlv, No. 4, March 1918.

[5] Janeway, H. H. (New York): Radium Therapy in Cancer. Hoeber, New York, 1917.

[6] Bovie, W. T. (Boston): Journal of Medical Research, Vol. xxxix, pp. 223-231, November, 1918.

[7] Schaper: Deutsche med. Woch., pp. 1434-1465, 1904; Hertwig, G. (Berlin): Archiv. für Mikros Anatomie, B. 77, Abt. ii, p. 165, June 30, 1911; Hertwig, O. (Berlin): Archiv. für Mikros Anatomie, B. 77, Abt. ii, p. 97, June 30, 1911.

[8] Lazarus-Barlow (London): Proceedings of the Royal Society of Medicine, Vol. xl, Sect. Path. 1, 1918.

# VISCEROPTOSIS AS A CAUSE OF "STOMACH TROUBLE."

By William D. Reid, M.D., Boston.

Visceroptosis has received a large share of attention from orthopedists and internists during the past two decades, and medical literature is not lacking in excellent articles on the subject. Nevertheless, one continues to see cases not yet diagnosed, though they have passed through the hands of one or more physicians. The type to which the writer refers is that in which the patient comes for relief of "stomach trouble." It is not held that this paper will present new facts, but it is hoped that it may lay further emphasis on an important subject.

The American Illustrated Dictionary defines visceroptosis as "a prolapse, or the falling down, of the viscera." It is sometimes called Glenard's disease, splanchnoptosis, enteroptosis, or gastroptosis, but the term visceroptosis seems preferable, as it is well known that the condition often includes the thoracic organs as well as those of the abdominal cavity; ptosis of the heart or "dropped heart," is recognized by all cardiologists.

A lack of good physical development is typical of the individual with visceroptosis. The appearance of such patient has been aptly described by stating that they carry themselves in the "posture of fatigue." Any medical officers who happened to serve with the Special Training Battalion in France, as did the writer for a short period, saw many examples of undeveloped young men who were physically unfit for military duty.

Malnutrition is also associated with visceroptosis. In 1918, Max Einhorn, in a paper entitled "Enteroptosis and Malnutrition,"[1] again emphasized the dependence of one on the other. One further notes the close relationship between the development and state of nutrition as found in the French children examined by the American Red Cross. The report by Dr. William P. Lucas gives the figures for development as: good, 19.4%; fair, 37.5%; poor, 42.4%; and for nourishment as: good, 19.4%; fair, 44.3%, and poor, 36.3%.

But to proceed to the case as seen by the internist. Commonly one is told that he is to be consulted about a case of "Stomach trouble," gastric ulcer, perhaps, and that the patient has been ailing for some time but has failed to obtain relief in spite of the attention of one or more physicians. In the writer's opinion, the patient, and at times the family, may all be said to be in a state of neurasthenia. And small wonder, as they often have been given as many opinions as they have consulted doctors,—some advising resort to surgery and others against. This variation in the advice received generally has an upsetting effect.

At this point a few case reports will best serve to picture the type of patient to which the writer would draw attention.

Case 1. Single woman. Seen June, 1915. Aged 34 years. Canadian; school teacher. Said to have gastric ulcer, but patient believes cancer to be the correct diagnosis. Family History—Negative. Past History—Chicken-pox, scarlet fever and measles in childhood. "Sort of puny" until 13 years old. Sore throat once a year. "Rheumatics" past four or five years in knees, back, and posterior aspect of left thigh. The backache was bilateral and low down; no story of trauma. Aspirin gr. v. t.i.d. of uncertain value. Repeated colds in winter of 1913-'14.

Catamenia began at 13 years, regular, two days duration, rather painful. Bowels, "bad all my life," sometimes fail to respond to two heaping teaspoonfuls of Epsom salts. Micturition: night once, none in the past three weeks; day, four to six; never painful. Drinks eight glasses of water per day. Weight, 140 pounds at 14 years, 125 to 130 about five years ago, 130 in the fall of 1914; present weight is 102 pounds and has been gaining of late.

Present Illness—Dates illness from fall of 1914. About one week of abnormally great appetite, with burning epigastric pain. (August, 1914, "severe cramps of bowels," but almost nothing passed. Pain was located in the lower abdomen, and patient thinks that it ceased in about two days. About once every summer has had a similar though milder attack. Isn't certain if the attacks have occurred at other times of the year. In 1906, there was a severe attack which confined the patient to bed for two days. Not aware that there was any fever at that time.)

Felt well until August to November, 1914. Attack of "rheumatism" in the fall; never any objective symptoms. Gradual appearance of craving after meals, which was attributed to extra studying. This "gnawing discomfort" was immediately after meals, at first of limited duration and later constant. "Would wake up with ravenous appetite, eat a large unusual breakfast, and then was ravenous all the morning." Strict milk diet and bismuth gave relief.

Jan. 10—Feb. 5, 1915, was a patient in a small Canadian hospital. Treatment consisted of rest and diet, or rather patient would eat but little—chiefly milk. Studies of the gastric contents were made.

Feb. 6—March 25, 1915, was in the Toronto General Hospital. Gastric analysis and roentgen examination were performed. Attack of pain after taking a fruit drink (was told that the gastric contents did not show acid). Baking soda did not give relief. Treated at first by starvation and in the course of ten days the diet was increased — gruel, junket, custard, whipped white of egg; to cream of wheat, poached eggs on toast, arrow root biscuits, etc. On first starting to eat, everything caused pain, but this gradually wore off. Milk and raw eggs relieved the gnawing pain. Was improving the last three weeks of stay in hospital, but felt as though the pain in the midepigastrium was just about to break out. Diagnosis stated to have been gastric ulcer.

March 25 to date (June, 1915) has been at home. Pain returned promptly. For three weeks remained in bed and on a restricted diet. Since then has adhered to a soft diet, save for occasional breaks. Calcined magnesia and antacids have relieved at times. Some gain in strength, but is able to eat very little.

Present complaint is, "I cannot eat without pain and so simply starve." There are very few things that do not cause pain.

Liquid perolatum worked beautifully on bowels for a while, but later diarrhea followed, so it was discontinued. The constipation seems to cause epigastric pain. Has had no emesis since December, 1914, except for three times after calomel. Never noted anything like coffee grounds, blood, or food of the previous day; maximum amount was less than one pint. Doubts if ever passed a "tarry stool."

Physical Examination—Thin, nervous woman. Pupils equal and react to light and distance. Mouth, glands, lungs, heart, and reflexes normal. Chest flat, costal arch narrow. Abdominal wall shows moderate sagging. Liver palpable one and on-half finger's breadth below costal margin in right mamillary line; upper border at seventh rib. Right kidney easily palpable, non-tender. Slight tenderness in epigastric region, no masses felt. Standing posture poor.

Hemoglobin 75%. Guiac test on stool negative.

Bismuth roentgen examination. No definite evidence of disease. Moderate cecal stasis. Well-marked gastric and intestinal ptosis.

The above patient came to Boston convinced that a surgical operation offered the sole remaining hope. A surgeon was consulted, therefore, but he advised that medical treatment be given a further trial. The patient previously had not treated herself fairly. On questioning about the diet, she learned that at times she dieted too strictly, living on nothing but milk and working at the same time, or even went from one to three days at a time without any food. She stated that at the Toronto General Hospital a positive diagnosis of gastric ulcer was made and yet in spite of seven weeks' treatment, she obtained merely temporary relief. At the time of her arrival in Boston, this patient was in a state of marked hypochondriasis and, as stated above, had fixed upon cancer in an incurable stage as her true complaint.

A diagnosis of visceroptosis with a possible chronic appendicitis was made and explained to the patient. Treatment based on this and the mental condition was followed by a rapid return to health; in six weeks this lady gained 20 pounds and returned to Canada. By winter she had gained 40 pounds and was enjoying the snowshoeing. Save for an operation for appendicitis, performed in 1918, her health continues satisfactory.

Case 2. Woman, 26 years of age, single, seen January 7, 1916. Chief complaint is "run down" and "indigestion." "Has just had a crying spell and is so discouraged about her health." Several "colds" this past winter and is said to have some nasal catarrh. No cough or sputum at the present time. Gets tired easily and this has been especially noticeable the past four days. Appetite fair; is apt to have gas and some gastric discomfort if eats when tired. Notes the symptoms one-half hour after meals, sometimes, but they are generally irregular in time of appearance. There are periods when the patient can eat all sorts of food without discomfort. Bowels move daily, but require a laxative medicine every four or five days.

No history of "rheumatism," tonsillitis, or the infectious diseases of childhood.

Physical Examination—Lying comfortably in bed. Poorly developed and thin. Chest flat, costal arch narrow. Eyes, mouth, teeth, glands, and lungs normal. Heart, apex impulse in fifth space midclavicular line; percussion corresponds. Blowing systolic murmur at apex, transmitted to base and slightly into axilla. Pulmonic second sound not accentuated, louder than aortic second. Sounds good quality, action regular. Pulses equal, regular, rate 81, soft, fair volume and tension. Abdomen soft and tympanitic, no masses or tenderness. Liver and kidneys not palpable. Knee-jerks present and equal, no Babinski, no edema. Weight taken the following day) 96 pounds.

This young woman was definitely of the overambitious type. She was a member of two high-grade choral societies in addition to helping her mother with much of the housework and taking an active part in the work of her church. She was always ready to take on more work.

The effect of poor nutrition and generalized ptosis was explained to her. She was advised to diet to increase her weight, and to rest more. Some temporary use was made of tonic and digestive medicines. The fitting of a suitable corset was supervised and the patient was shown the correct posture of the body. There has resulted a definite improvement in health. The patient has made a considerable gain in weight and has no further digestive trouble unless she distinctly overdoes.

The heart is obviously the type that is termed "effort syndrome," or "cardiac neurosis." This patient is of interest chiefly as illustrating the handicap of visceroptosis to an ambitious young woman, and how large a part of this may be relieved by recognition of its cause and suitable treatment.

Case 3. August 22, 1919, woman, 37 years; married. Chief complaint, "indigestion," especially during the past four days. Sensation of lump in throat one-half hour after meals. This lasts an hour or more and then there is a sensation around the navel "as though someone was kneading me with sharp knuckles." On lying down, these symptoms are relieved, but they return promptly if the upright posture is resumed. Similar symptoms have been present at times in the past ten years, but have never been so severe.

Diet—Breakfast, cracked wheat and milk; lunch, an egg, milk, bread and butter, and a simple dessert. Has eaten but sparingly of summer vegetables.

Bowels move scantily several times daily; no diarrhea. Has tendency to constipation. Has chronic catarrh of nose and throat and is a little short of breath on exertion. No cough.

Was in "splendid health" in June, 1919. In July, attempted to hoe in garden and now is tired even on making beds, sweeping, etc., so that hands tremble. This over-fatigue passes in a day. Last catamenia two weeks ago; average two days in duration and of but slight discomfort. Best weight, 122 pounds, in 1903; one year ago was 98 to 100, and now is 105.

Past History—Began to wear corsets at the age of eighteen when patient was said to have had a slight curvature of the spine. Wore a stiff type of corset for three years and since then one of the light girdle type. Is "tired" if she doesn't wear her corset. At the age of 27 years was "generally run down": couldn't walk without extreme fatigue and aching in the lower back. Given a diagnosis of uterine displacement and treated for two years with tampons and pessaries. Didn't recover full health until at the age of 31 an orthopedist tilted the heels of her shoes to correct a weak posture of the ankles.

Physical Examination—Poorly developed and thin. Pupils, mouth, glands, lungs, heart ,and knee-jerks normal. Chest long and narrow, with anterior flattening. Costal arch narrow. Abdomen shows moderate sag to wall of lower half. Liver, sixth space to two and one-half fingers breadth below costal margin in right mamillary line. Kidneys easily palpable.

Prompt improvement followed treatment. It is clear that the pelvic and foot conditions, treated in the past as separate entities, were but part of the general picture which the writer terms visceroptosis. One cannot but doubt the need for the gynecological therapy.

The case is introduced here because of the presence of points in the history which, together with the general appearance of the patient, strongly suggest the diagnosis. These points are the history of pelvic displacement, ankle weakness and especially the fact that the present gastric complaint was favorably influenced by rest and the horizontal posturs.

Case 4. Woman, 64, married, seen October 6, 1919 Is being treated for gastric ulcer by a "stomach specialist" in a western city.

Family History—Parents died of old age. One brother, two sisters, three daughters and one son living and well.

Past History—Had the usual children's diseases, never strong. Married at 27, childbirths easy. At 50 had pneumonia twice. Typhoid fever with good recovery at 51. Menopause at 53 and was quite miserable for two years. Hemorrhoids which were cured about fifteen years ago.

Digestive symptoms commenced more than ten years ago. Terms them "sick spells," with nausea and occasional regurgitation of mouthful of material always of a watery nature. These attacks occurred only when the patient was overtired. In 1915 underwent cholecystectomy with the removal of one large gall stone. The preoperative symptoms were chiefly about six attacks of severe pain in the course of two years. There was no jaundice. Patient is of the opinion that the operation has been of benefit to her health.

Present Illness—In the past two years has had "sick spells" three to four times per year. May be sick a month and it is usually several weeks before she is well. These "spells" are characterized by pain of moderate intensity and located in the epigastric region. The pain is likely to be present about bed time, is indefinite in type and duration, and apparently has no relation to meals. It never radiates to arms, shoulders or back, and is described as "not severe," and "it comes and goes."

About September, 1918, was a patient in a hospital in a western city under the care of a "stomach specialist." Gastric analysis was performed and a diagnosis of ulcer of the stomach given. Roentgen examination was not made until May, 1919. Patient was kept in bed for five weeks and treated by diet, alkalies, etc. A gain of 11 pounds in weight was achieved and the symptoms disappeared. Is now on a diet (of very bland type) and uses digestive powders (mostly magnesium oxide). Has again lost weight and is easily fatigued when the epigastric pain returns. There is very little gas in the stomach.

Bowels have always been inclined to constipation and do not move easily in spite of the daily use of laxatives. Micturition normal, occasionally once at night and six or more times per day. Urine about one quart per 24 hours. Best weight 124 pounds; was 105 when married and not above this in the past ten years; now 98 pounds. Not short of breath on reasonable exertion; no swelling of feet.

Physical Examination: Small, poorly developed and nourished woman of rather active, nervous type. One carious root in mouth, upper teeth false. Heart—Apex impulse well inside mid-clavicular line, drop-shaped by percussion. Soft systolic murmur at apex with short transmission, pulmonic second sound accentuated. Abdomen—Marked sagging of the lower half of the abdominal wall. Surgical scar extending from the right epigastrium to McBurney's point. Lower border of liver two and a half fingers' breadth below costal margin in right mamillary line, upper border at seventh rib. Right kidney easily palpable. Chest flat with narrow costal arch. Moderate lordosis of lumbar spine. General posture strikingly that of visceroptosis.

Blood pressure 135 to 60. Weight 98 pounds.

Roentgen examination was negative as far as any evidence of organic disease was concerned. There was marked ptosis, particularly of all the organs of the right side. The upper edge of the liver was on the level of the twelfth dorsal vertebra. while the lower edge came well down to the crest of the ilium. There was ptosis of cecum, ascending colon and hepatic flexure, but the splenic flexure was in normal position. General stasis existed throughout the colon.

The above history does not picture gastric ulcer. The evident ptosis on the physical and roentgen examinations, the appearance or increase of the symptoms when the patient was fatigued and the absence of roentgen evidence of organic disease indicate visceroptosis as the true diagnosis. A recent letter gives information that this lady has obtained satisfactory improvement following treatment based on the diagnosis of visceroptosis.

### DIAGNOSIS.

The above case histories, it would seem, well illustrate the so-called "stomach case" in which visceroptosis is the cause. In accordance with the belief that a careful history is essential in the diagnosis of cases in which gastric symptoms present, one finds himself rather bewildered after having completed the anamnesis. The symptoms are so irregular that no disease is definitely pictured and one learns by experience that such a history is consistent with visceroptosis, which may often be suspected at the first sight of the patient. In the experience of the writer, it is common to find, in addition, a mental state of the neurasthenic type. If the physical examination shows well-marked visceroptosis, and the picture of no other disease is definitely present, the diagnosis becomes almost certain. But to be doubly sure, and especially in case the patient is impressed that carcinoma or some other serious disease exists, it is generally necessary to include roentgen examination. If this latter fails to disclose definite evidence of organic disease, one is in a position to talk just so much more convincingly to the patient. Thus, diagnosis is worked up from the history, physical examination, laboratory tests, such as the examination of the urine, blood, guiac test on the stool, at times gastric analysis and, if possible, roentgen examination after the bismuth meal, and, given the findings of visceroptosis and absence of those of other disease, the patient should be treated for the former. Of course, not every case of visceroptosis has gastric symptoms, and again the patient with visceroptosis may have gastric ulcer or other lesion. That is why each case should be completely studied.

*Treatment* should be directed toward the mental condition of the patient, toward his nutrition, and finally toward his mechanical handicaps.

In the experience of the writer, most patients coöperate better if some pains are taken to explain the nature of visceroptosis. A comforting suggestion is the statement that visceroptosis is not a true disease but rather a state of imperfect physical development. Many a patient is grateful to finally learn that there is a reason for an undue readiness to tire, etc., as sometimes the failure to appreciate the underlying cause has resulted in the patient being treated as lazy or as a quitter.

Those patients who have developed an unfavorable nervous state require all the suggestive therapeutics and personal attention suitable for that condition. These are the ones in whom negative roentgen evidence is of added value in convincing the patient of the absence of cancer, ulcer, etc.

The patients are practically always undernourished, and if they can be made to put on some fat, much benefit is gained. W. R. P. Emmerson, who has been so successful in his nutrition clinics, lists the causes of sub-nutrition as follows: physical defects, home conditions, over-fatigue, food habits, and insufficient food (poverty). One should investigate the patient's life with sufficient care to disclose and meet any of the above conditions.

Some patients have been underfeeding (as in Case I) so severely that an increase of food causes distress. In such a case, it must be explained that to continue on the insufficient diet will never produce a return to health, and that it is better to eat and suffer, as the discomfort will cease after a few days. Suitable digestive medicines are indicated, and in case of real distress, there may be need of a sedative to relieve gastric hyperesthesia. Better give tincture of valerian, bromides, or even codein or morphine, temporarily, and start the patient on an increasing diet. It is suggested that the amount of food intake to which it is necessary to bring the patient, be controlled by its caloric value (of course it should be readily digestible). Those not accustomed to estimate the calorie value of diets will find it quite simple if they will avail themselves of such helps as "Food Values in Household Measures," compiled by Franklin W. White,* and the food tables by H. D. Arnold.[2]

Constipation, which is usually present, commonly lowers the state of general health and the fecal load also mechanically assists in the downward drag on the intestinal tract. It should be carefully treated, especially by instructing the patient in the hygiene of the bowels, etc. The use of liquid petrolatum U. S. P. is often helpful in this type of case.

On the mechanical side, of course, the orthopedist has led the way, but in case it is not convenient to consult with an orthopedic specialist, it is quite possible for the general practitioner to meet the need. Some sort of support is needed for the sagging abdominal wall. A properly fitting, straight front corset can generally be made to give the desired support. It has always seemed desirable to the writer to train the patient to adapt some stock form of corset to her needs, as then she is in a position to continue this form of treatment indefinitely, even if she ceases visiting a physician.

The patient should be instructed how to stand correctly and, especially if young, should be given exercises directed towards improving the development. A recent article by Lloyd T. Brown[3] pictures, by the silhouette method, the striking improvement which may be obtained in a child after but three months' treatment. In the more severe cases, it is generally necessary to advise reclining for an hour after meals, in a posture which relieves the downward drag of the abdominal organs. Two positions which have been of use to the writer are: lying on the back with a pillow under the hips, none under the head, and the knees flexed; and lying prone with a pillow under the lower abdomen. Textbooks on orthopedics and the numerous articles in medical journals should be consulted by those desiring more detailed directions as to exercises, postures, etc.

### SUMMARY.

In this paper emphasis is placed on cases of visceroptosis presenting "stomach symptoms."

A lack of good physical development and subnutrition are commonly associated with the condition.

Four case reports are given to picture the type of case under discussion.

The diagnosis is based on evidence obtained in the history, physical and roentgen examinations. Organic disease should be excluded in these and by suitable laboratory tests.

Treatment should be directed toward the patient's mental condition, toward his subnutrition, and toward his mechanical handicaps.

REFERENCES.

[1] Am. Jour. Med. Sci., 1918, Vol. clv, p. 85.
[2] Jour. A. M. A., Dec. 24, 1910.
[3] Boston Medical and Surgical Journal, Feb. 19, 1920. See also the group of articles in this same Journal for June 24, 1920.

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* Obtainable of F. H. Thomas & Co., Boston, Mass.

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## THE ESSENTIAL FACTORS OF CANCER CAUSATION.

By James W. Shannon, M.B., San Diego, Calif.

*(Concluded from page 609.)*

The practice of the Japanese in regard to bathing differs from the methods customary in this country and Europe chiefly by reason of greater frequency, avoidance of cold water, and of the higher temperature at which the bath was taken. Inasmuch, then, as greater frequency in bathing implies a greater exposure to water, we should expect—other things being equal—the incidence of cancer upon the parts exposed to water in bathing (*i.e.*, upon the breast and skin) to be higher among Japanese than among Americans and Europeans, which is not the case. The figures hereinbelow (for which we are indebted to the aforementioned work of Dr. Hoffman) show that among the Japanese breast-cancers and skin-cancers are approximately eight times and four times, respectively, less frequent than among Americans.

| | Japan per 100,000 Pop. | | U. S. Registration Area per 100,000 Pop. | |
|---|---|---|---|---|
| | Males | Females | Males | Females |
| Skin ............ | 0.9 | 0.6 | 3.5 | 2.1 |
| Female breast .... | ... | 1.8 | ... | 14.3 |
| Stomach and liver | 48.4 | 31.4 | 28.8 | 30.5 |

In view of the fact that the incidence of cancer upon the stomach is higher among the Japanese than among Americans, we cannot suppose, either that the Japanese enjoy any racial or environmental advantages with respect to the disease, or that, under conditions of equal exposure to its causative agent, any such difference as that revealed by the above figures between the rate of cancer incidence upon the skin and upon the breast in Japan and in this country could arise. The facts represented in the foregoing table can, therefore, be regarded in one way only, namely, as evidence that *in Japan the skin and the breast are not exposed to the causative agent of cancer to the same extent or degree as in America.* If, then, we consider: firstly, that the skin and the breast are the only parts of the body exposed to water in bathing; secondly, that in Japan avoidance of cold water, and the use of water for bathing at much higher temperatures than is customary in America, is universal; and, thirdly, that as compared with Americans the Japanese are comparatively free from skin-cancer and breast-cancer, we cannot doubt that, upon the parts exposed to water in bathing, avoidance of cold water and the use of water at high temperatures tend to act as a preventive of cancerous disease.

Protozoal organisms are extremely sensitive to changes in their environmental conditions, and it is therefore very doubtful if any species could withstand exposure to a temperature so far in excess of that which is natural to them as the temperature of a Japanese bath for any considerable length of time. It happens, then, that, whereas Americans and Europeans bathe in water ordinarily containing large numbers of *living* protozoal organisms, the Japanese only expose themselves to water which, in so far as protozoal organisms are concerned, is *sterile,* or nearly so. Consequently, although exposure of the skin and the breast to water is greater among the Japanese than among Americans, exposure to the living organisms contained in water is less. In view of the fact that exposure to the living organisms in water affords a consistent explanation both of the low rate of cancer incidence on the skin and breast in the case of the Japanese, and its high rate of incidence in the case of Americans, we have no choice but to believe that the relation of water containing living organisms can possibly be otherwise than causative.

Cancers of the skin, like all other manifestations of the disease, result from contact of water with lesions and, consequently, are most frequent in those parts in which the opportunities for such contact are greatest, *i.e.,* on the hands and face. The skin of the face is attacked because—and especially in elderly persons—it is commonly the seat of lesions, and also because, as a matter of ordinary routine, it is, with the exception of the hands, exposed to water more frequently than other parts. It is well to remember that when the skin is inflamed, ulcerated, or tender, the use of a towel is likely to be painful, and that consequently there is a disposition to allow water to remain longer at the site of lesions than upon parts of the skin which are healthy. Indirectly, therefore, lesions contribute to their own chances of becoming cancerous.

Skin-cancers of the hands and other parts are due to the same principles of causation as cancers in general, and were it not that in certain cases they serve to illustrate the closeness of the association between lesions and water, they would have no particular interest. For a long time it has been known that workers engaged in occupations which require exposure of the skin of the hands, forearms, or other parts, to chemical, mechanical, or other injurious influences, as, for example, workers in x-rays, paraffin, creosote, tar, soot, etc., are prone to suffer from skin lesions which show a special tendency to become cancerous, but it seems that little or no attention has been given to the highly important fact that, in addition to causing lesions, these occupations, directly or indirectly, demand exposure of the injured parts to water. X-rays, for instance, cause "burns" which are exposed to water, partly for reasons of cleanliness, but more especially in the course of photographic work; paraffin, creosote, tar, etc., cause dermatitis, and being both irritating and difficult of removal, demand exposure to water, not only for reasons of cleanliness, but also for comfort; soot causes abrasions of the delicate skin of the scrotum through friction against the soot-impregnated clothing, and because the grimy nature of a chimney-sweep's occupation renders frequent bathing of the whole body imperative, and also because water tends to be retained in the folds and rugosities of the skin of the part affected and is therefore difficult of removal under any circumstances, but much more so when the parts are abraded or tender.

Cancers of "other organs, or of organs not specified," constitute about one-sixth of all cases of the disease, and in the absence of sufficient data, it seems reasonable to believe that the principles underlying their causation are in nowise different from those which we know to be operative in all other cases. The parts included in this class comprise cancers of the genito-urinary system, connective tissues, bones, cartilages, lymphatic and other glands, serous membranes, blood-vessels, and possibly the blood, all of which, while they may be the seat of primary cancer, are affected so rarely that, in comparison with the pylorus, cervix uteri, breast, etc., they seem to be almost immune from the disease. This is significant because of the fact that, whereas the pylorus, cervix uteri, breast, etc., are regularly exposed to water, such exposure in the case of the parts aforementioned is an exceedingly rare occurrence. It is well known that under certain circumstances protozoal organisms (infusoria) may infect the genito-urinary system, and when it happens that lesions are present at the same time the development of cancer becomes possible. Also, the connective-tissues, bones, glands, etc., are exposed to protozoal infection, the result of which may become manifest at the site of an injury or other lesion; or, protozoal organisms may be carried in the blood-stream, to some organ or part of the body remote from the seat of injury.

Although the foregoing is only an outline of the more prominent features of the cancer problem, yet it should serve the purpose for which it was intended, namely, to establish the fact that cancer is a preventable disease and to point out the course to be pursued in order to bring it under control. Theoretically, cancer is preventable by the elimination of any of the factors essential to its causation, but, for practical purposes it is necessary to consider only two, namely, lesions and water. Attempts to prevent cancer by the elimination of lesions have doubtless been successful in particular cases, but, as a measure for general adoption they are open to objection on the ground, firstly, that except in the case of the skin, mouth, and a few other easily accessible parts of the body, it is practically impossible to discover or eliminate lesions with the degree of certainty and precision necessary for the purpose; secondly, that it is impossible to guarantee the freedom of lesions from contact with water in the stomach and other important parts; and, thirdly, that after everything has been done that is possible in this direction, the causative agent of the disease still remains active. From these considerations it is obvious that there can be no prospect of controlling cancer on a large scale by the elimination of lesions.

The fact that the causative agent of cancer is conveyed to the body in water only renders it at all times completely subject to control, and enables us to prevent the disease with a degree of certainty which is absolute. From what has been said concerning the causation of cancer, it follows that the use for drinking, washing, bathing, and other personal purposes of water sterilized by boiling must, by destruction of the cause, insure the prevention of the disease. The experience of the Japanese suggests that a temperature lower than that of the boiling-point might suffice, but inasmuch as it is desirable to fix a standard which is safe, and at the same time easily recognized by all classes of persons, and since, moreover, the sterilization of water is of value in the prevention of diseases other than cancer, it would seem unwise to forego these advantages.

REFERENCE.

[1] "What We Know about Cancer," A handbook for the medical profession, prepared by a committee of the Amercan Society for the Control of Cancer, and published jointly by the American Society for the Control of Cancer and the Council on Health and Public Instruction of the American Medical Association.

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A MEETING of physicians of New England who are interested in the historical and cultural aspects of Medicine, was called for the purpose of organizing a Medico-Historical Club in Boston, at the Boston Medical Library, on May 31. Four or five program meetings a year are contemplated.

## Clinical Department.

### TWO CASES OF ACARAPHOBIA.*

By Abraham Myerson, M.D., Boston.

[From the Department of Nervous Diseases, Boston City Hospital; Department of Neurology, Tufts College Medical School.]

Under the names of acaraphobia, dermatophobia and parasitophobia, the dermatologists recognize a mental state which they loosely define as an obsession, neurosis or mania, which occurs with pruritus and which, concisely, is the fear of insects or bugs. It is probable, according to the description in the text-books and that given me by Dr. Thorndike, that the mental state, so designated, ranges from a simple fear allied with other phobias, to a true delusional state or psychosis. So far as I can find, the psychiatrists do not describe any mental disease associated in a definite way with skin disease, excepting pellagra, and here the symptoms are not linked in a delusional manner with the skin manifestations.

The term "haptic hallucinations" is used in psychiatry to describe the type of hallucination where the field of error relates to impressions received by the skin. In this condition the patient describes crawling, biting, burning, etc., sensations attributed to bugs, animals and various agencies. These hallucinations occur particularly in the toxic mental states such as cocainism, alcoholic insanities and some infections. In the two cases which I here report, the psychosis in each case was definitely associated with skin disease. In the one case with leucoderma or vitiligo, and in the other with a lesion resembling leucoderma but differing from it in its extraordinary transiency. The first patient presented a pseudo-paranoid psychosis of slow evolution, while there developed in the other case a hallucinosis and confusion associated with profound bodily disturbances.

Case 1. Seen at Boston Dispensary and Boston City Hospital, forty years of age, a white male, Irish by birth and parentage, of sturdy physique and without known psychopathic heredity or relationship. Some years ago he noted a change in his skin, certain portions of it became white, and at the site of the lesion there was some slight itching. This itching he interpreted at first as due to the skin lesion, but slowly he began to consider the possibility of its causation through bugs of some kind. Gradually there developed a definite belief that the cause of the itch and the skin changes was some sort of insect despite the fact that he was never able to see the bug. He was able to feel them, however, and he was sure that they lived under his skin, coming out now and then to crawl over him and bite him, to infest his clothes, etc. His belief that there were bugs on his body was corroborated by the following "facts," as he styles them:

No matter where he is or goes, people around him begin to scratch their bodies and strike themselves as if they were killing insects. He has often noticed that a group of people will be sitting quietly, say in a street car, until he sits down amongst them or stands near them. After a short time, everybody gets uneasy, especially those nearest to him, and this uneasiness is succeeded by wriggling, scratching and striking themselves. This is caused by the bugs which jump from him to the others, and he feels that some people suspect him as the source of the bugs. Nobody acuses him openly, but some look at him in a peculiar way and move furtively from him.

Asked where the bugs come from, he says he does not know. They must live under his skin, for he feels them. Possibly the white patches are their habitat. To get rid of them he has bathed in all kinds of solutions and, according to his own account, has endangered his life thereby. He has frequently sterilized his clothes, and on several occasions has discarded perfectly good outer and undergarments, and has purchased entirely new clothes in the hope of getting rid of his tormentors. All this has been to no avail.

He has no delusions or persecution, does not accuse himself of any crimes or sins, has no ideas of grandeur and no other somatic delusions, no other hallucinations other than the tactile ones He works steadily, shows absolutely no memory loss or dementia; he yields to no arguments whatsoever, and seems quite disgusted when the physician fails to agree with him that there are bugs on his body.

Physical examination is negative throughout except for the distribution of leucodermic patches on hands, chest, abdomen and legs. These patches have been seen by dermatologists and diagnosed as leucodermic. They are increasing in size, the pigmentation disappearing constantly. Wassermann in blood, negative on several occasions.

Undoubtedly this psychosis represents a simple development of a sensation into a delusion through the propensity of human beings to explain their condition. Man seeks constantly to understand his sensations, seeking constantly that mental resting place which is an explanation Skin sensations are primordially related to insects, and a persistent sensation can easily be conceived as bringing about an idea of bugs. For untold centuries parasites have lived in the skin and hair and appendages of man, and it is only very recently, and in a relatively small part of the human population that parasites have been expelled from their habitat on the surface of the human being.

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* Read before the New England Society of Psychiatry.

The delusion that the bugs jumped to others is harder to understand until one objectively watches people or one's self. The term "objectively watches" is here used to mean watches them without regard to the meaning of their movements. It will be then seen that the scratch is perhaps the most common of human actions. Not only is it a result of fugitive sensations of remarkably frequent occurrence and of direct bodily origin, but it is almost inevitably related to certain mental states, such as boredom, fatigue, uneasiness of any kind, and perplexity. Wherever one goes people are scratching themselves, and especially is this prevalent amongst those of common manners, uninhibited in their reaction to sensation and emotion.

Further, the itchy sensation is remarkably contagious. Let one person scratch and those in his vicinity are impelled to do likewise. Undoubtedly this man communicated a part of his uneasiness to others by a sort of mental contagion.

Case 2. Man, forty-two, married, two living children; one child died early in life. Wife is well, the family history is negative, habits are always good. His general life history is negative. Always well until September, 1918, when he had influenza-pneumonia. He was sick six weeks. During his sickness a peculiar pigment loss was noted on the knuckles of his hands. The loss was in discrete patches, varying in size and irregular in shape. There was a slight crawling and itching feeling in the affected areas. After his recovery the pigment gradually returned.

He went back to work but commenced to feel run down. To overcome this, he gave up his work as clerk for outdoor work on a wagon. He did not do so well at this kind of work as he expected, and in June, 1919 (nine months after the influenza), he became sleepless, very tired and restless; his appetite disappeared and he developed a diarrhea of mild intensity, with three of four ejecta per day Somewhat later there appeared excruciating pain in the knees, and when this subsided, burning sensations in the abdomen and feet commenced to plague him. Similar pains over chest and back occurred, and then all these sensations were gradually replaced by crawling, itching and biting sensations. These latter became the most important of the paraesthesiae and persisted. Perspiration was excessive and was associated with hot and cold feelings all over the body. A rash broke out all over the chest, back and abdomen, and on July 12, 1919, he went to the Peter Bent Brigham Hospital, where he stayed one month. I am indebted to the authorities of that hospital for allowing me to make an abstract of their records in his case.

"Very restless, very apprehensive, sweating freely. Pigment lacking over knuckles. Over the back and chest a Macula-papular red eruption thought to be due to bromide. Pulse rate, 110. Blood pressure, 132-110. X-ray of heart shows it to be wide in the region of the right auricle. Nervous system shows a coarse tremor with a few mystagamoid twitches of the eyeballs in the end positions. Knee-jerks very lively, but equal; also ankle jerks. Cremasters and abdominals sluggish. Urine, 1200 cc., 1018, hyalin and granular casts with some white and red blood corpuscles. Blood, white cells 10,800, 58% polymorphs., 37% lymphocytes, 5% mast cells. Wassermann reaction negative in blood. All tests of spinal fluid entirely negative.

Gastric contents show lack of free acid. Stool shows much mucous. The x-ray of the gastrointestinal tract showed a colonic stasis, as it took barium twenty-four hours to reach sigmoid and forty-eight hours to reach rectum. Metabolism plus 25."

Hyperthyroidism was suspected at the Brigham Hospital because of increased metabolism, the gastrointestinal symptoms, the rapid pulse and the nervousness. He became more sleepless, restless and nervous, and because of this was sent to the Psychopathic Hospital for observation as to his mental condition.

His stay there revealed nothing new, and at the end of ten days a charitable organization sent him to a Convalescent Home. There he stayed six weeks and it was there that his mental symptoms first reached prominence. Because of these symptoms, he was sent home, where I first saw him October 1, 1919.

Physical Examination—A much emaciated man, five feet eight inches tall, lying quietly in bed. The main findings were these: Pupils somewhat dilated but reactions O. K. Reflexes throughout body markedly hyperactive with wide zone of elicitation. The muscles when tapped swelled at the point of stimulation and remained angularly elevated. There were no B, G, O, ankle clonus, paralysis, ataxia or sensory change.

Over knuckles and over chest and back were discrete, irregular patches without pigment, smooth, not elevated and painless. These corresponded in appearance with leucoderma. The skin on the chest, especially over abdomen, was unusually and diffusely dark. The mucous membrane showed no change. The blood pressure was 130-100, heart rate 100, temperature, 99. Chest negative.

Mentally, he was oriented for time, place and person. His memory was good for very remote events and for the more recent events he claimed that the events of the last two weeks were quite jumbled in his mind. He remembered and told in detail a hallucinatory episode: A dead man entered his room at the sanatorium and they had a fight in which he destroyed the dead man and hid him under the bed clothes. There his victim became very active. Finally people burst into his room, his opponent disappeared, and he went to sleep.

He had very definite haptic hallucinations and delusions. There were large and small bugs on his body and they made their home in his skin. They bit and scratched him, with only an occasional let-up for a few hours or a day. He often killed them by striking his body and could feel them flatten out under the impact, yet he could never see them or hear them. Sometimes they left his body and crawled on the sheets and blankets. This he could tell by the little movements of these furnishings.

He dismissed without argument the suggestion that this was a mistake and could not be. He was pleasant, friendly, and wanted to be cured of his weakness, his diarrhea and sleeplessness. He attributed most of his troubles to the bugs. His weakness, diarrhea, rapid pulse, and slight temperature suggested tuberculosis, but there was no evidence to corroborate this suspicion. Endocriminal disturbances were so prominent, to wit, the above-mentioned symptoms, the increased metabolism, the change in skin pigmentation, the restlessness, the myoedema, that this was considered the most likely diagnosis, though obscure. On account of his mental condition and his great weakness, he was sent to a private hospital for his mental disease. He stayed there eight weeks, received excellent care and feeding, and, to the surprise of everybody, made a remarkable improvement.

Mentally, he was entirely clear and had dismissed the idea of bugs. This was coincident with a remarkable change in the form of leucodermic patches. These presented the appearance of having been filled in by new skin containing normal pigmentation. There was only left of the former patches a few very small areas on back and chest that were still without pigment. The paraesthesiae had disappeared, he had gained weight, his temperature was normal, but the pulse was still 100. Though not nearly so strong as normally, he was able to get up and to walk. He perspired profusely and now and then had diarrhea.

In February, 1920, he was shown before the Boston Society of Psychiatry and Neurology, and at that time he was sleepless and restless and had a pulse of 110. Blood pressure 130-100. Blood picture was negative. Urine normal. Leucoderma had almost disappeared, but the darkened skin of chest and abdomen was still noticeable. Mentally he was clear and described his hallucinations with detail and interest. He ascribed them to the crawling, itching and biting sensations and to confusion of mind. He said that they disappeared gradually. He had not noticed any relation to the pigment loss or to the hyper-pigmentation.

In March, he was again losing ground, had a troublesome, hacking cough. Reëxamination showed definite evidence of well-advanced pulmonary tuberculosis. He was sent to the Boston Consumptives' Hospital and there died. No post mortem was held.

In discussing this case there are so many points of interest that one hardly knows where to begin. In the first place, the influenza-pneumonia was associated with a temporary de-pigmentation of an unusual kind. Later on, there appeared the evidence of a toxic-exhaustive state, with both de-pigmentation as described and hyper-pigmentation. The de-pigmentation was temporary and lasted about as long or perhaps somewhat longer than the psychosis, but the hyper-pigmentation persisted. Pellagra, though considered, was easily ruled out. In the first place, his diet was not different from the ordinary nor had he been exposed to the sun. In the second place, the patches were pale, smooth, located mainly on chest and back, whereas in pellagra the lesions are rough, diffuse, red like sunburn, and involve face, shoulders, genetalia and hands. Moreover, in pellagra the mental symptoms do not take the form they did in this case.

Addison's disease is strongly suggested by the emaciation, the weakness, the hyper-pigmentation and the tuberculosis, but the blood pressure was higher than in Addison's disease, and the mental state very unusual. Furthermore, disappearance of pigment of a temporary and recurring kind does not, so far as I know, occur in Addison's disease.

Hyper-thyroidism was of course a feasible diagnosis. The increased metabolism, the emaciation, the rapid pulse, tremor, nervousness, diarrhea, all go well with this condition. It seems likely that there was poly-glandular disturbance and that the injury was diffuse through the organism. Whether the exciting cause was a damage done by the influenza and the tuberculosis was a later and secondary disease, or whether tuberculosis existed throughout the course of the illness is a question that cannot be settled. The lack of post-mortem evidence is to be deplored, for information of great value would probably have resulted from an autopsy.

It seems likely, or at least I permit myself the liberty of speculating to this extent, that the delusion of bugs was founded on an interpretation of an unusually bug-like paraesthesiae. A certain amount of confusion aided the establishment of an explanation into a delusional state. From such sensations to the explanation as bugs, is the most natural step in the world and one deeply rooted in universal human experience.

These two cases point out that there is an important group of diseases theoretically which have not been studied by psychiatrists. It is desirable that the acaraphobia of the dermatologists receive the attention of psychiatry, for here are mental symptoms definitely referable to physical conditions in a manner that is at once unique and important.

## Medical Progress

### RECENT PROGRESS IN PROCTOLOGY.

By T. Chittenden Hill, M.D., Boston.

#### DIAGNOSIS.

Zobel,[1] in his article on "The Diagnosis of Anorectal Diseases," calls attention, in his opening paragraph, to the importance of careful routine examination of the anorectal region in all patients having anorectal symptoms. He says, "It is regrettable that too frequently the patient's idea as to what ails him is accepted by some of them (physicians) without further questioning, and without thought of any necessity for examination." "Pain, bleeding, itching, protrusion, the discharge of pus or mucus, constipation and diarrhoea are the principal symptoms complained of by those having anorectal trouble." Under these eight headings, he goes with some detail into the question of the lesions of which they are symptoms.

Of *pain* he says, "Uncomplicated internal hemorrhoids rarely give rise to pain. However, when the hemorrhoids become inflamed, ulcerated, or strangulated, pain then becomes a predominating symptom. One of the most common causes of anal pain is fissure of the anus. The true anal fissure is to be differentiated from the fine linear cracks often observed in the mucocutaneous tissues bordering the canal. The latter generally cause itching more than they do pain." Of rectal cancer, he says, "Pain is usually absent. The disease may go on to even complete obstruction of the bowel—that is, when it is located in the ampulla, or in the upper third of the organ—without causing more than an indefinite sense of uneasiness in the parts. Should such a growth become ulcerated, then pain commences. On the other hand, when the anal region, which is especially endowed with sensory nerves, is involved, there is early and constant acute pain, to which often is added most disagreeable, heavy bearing-down sensations. It may here be urged that whenever there is rectal pain the possibility of cancer should be ruled out." Among other causes of pain, he mentions inflammation and ulceration of a crypt of Morgagni, a foreign body impacted in the anal canal or imbedded in the anal mucosa, acute proctitis, rectal neuralgia, the rectal crisis of tabes, and the rectal aura of epilepsy. In a fistula, unless the external opening closes, thus allowing the sinus to become distended with pus, there is seldom pain; and abscess about the margin of the anus, in a crypt of Morgagni, or under the mucosa of the upper border of the internal sphincter muscle may cause so little pain as to be often mistaken by the patient for simply painful "piles."

Under *hemorrhage* the author goes into the importance of investigating this symptom, which may come merely from congested and eroded internal hemorrhoids, or may be the first warning signal of the presence of a malignant growth; or may be due, on the other hand, to multiple polypi of the bowel wall, hemorrhagic and amebic colitis, the friction of clothing against a chronically prolapsed rectum, the scraping of hardened feces at defecation on the fine linear cracks in the tissues immediately surrounding the anal orifice, simple fissures, injuries from foreign bodies, or roughly inserted syringe tips, rectal thermometers and examining instruments.

For ascertaining the cause of *pruritus* the author emphasizes the need of more than mere inspection of the perianal skin, a proctoscopic examination being as imperatively urgent here as with other rectal affections, for while sometimes the itching may be due to purely external causes, such as dermatitis, eczema, herpes, pediculi, parasites, etc., at other times it may be concomitant with some constitutional trouble;

it may be a reflex from disease in other parts, particularly in the genito-urinary organs; or it may be caused by an anorectal lesion, such as fissure, ulcerations, abraded internal hemorrhoids, small thrombi under the mucosa of the anal canal, subacute proctitis, catarrhal colitis, rectal growths, hypertrophied papillas, disease of the crypts of Morgagni, small blind fistulas, etc, or infection of the perianal skin by the streptococcus fecalis.

The causes of *protrussions*, Zobel enumerates as prolapse, marginal abscess, an anus bulging from fecal impaction, foreign body, condylomata, an epithelioma of the anus, or a pedunculated growth, any of which may be responsible for protrusion, rather than "piles," which to the laity, and evidently many of the medical profession, is the commonly accepted cause.

*Pus* appears from a fistulous tract, a rectly ruptured abscess, severe ulceration of the bowel mucosa in colitis, granulations of small ulcerations or fissures, and in malignant or even benign growths.

*Mucus* may be an early warning of malignancy; on the other hand, in almost every variety of colitis there is more or less excessive formation of mucus; fecal impaction, a foreign body, or growth may, by irritating the bowel mucosa, accelerate its abnormal production.

*Constipation.* This very common symptom, so little a matter of concern to patient or physisian, should be investigated by digital and proctoscopic examination for the underlying cause, which may be a tightly closed anal orifice with hypertrophied sphincter muscles, due, perhaps, to the presence of an ulcer, a fissure, a diseased crypt of Morgagni, or inflamed and ulcerated hemorrhoids; or, higher up, fecal impaction, an obstructing foreign body, a growth, a stricture, a deviated coccyx which pushes into the cavity of the rectum, an entire absence of the coccyx which allows of the formation of a retrorectal pouch in which the fecal matter accumulates, or a pelvic mass situated anteriorly and so occluding the rectal lumen that when it is accompanied by markedly hypertrophic valves of Houston, it is apt to give the examiner the impression that a well-developed stricture of the rectum is present.

Of *diarrhoea*, the writer says: "It may be taken as an excellent, and a very safe rule, always to make a digital and proctoscopic examination in every case where, notwithstanding intelligent treatment, a diarrhoea has lasted longer than a week. This may have to be supplemented by a fluoroscopic and radiographic examination, if no cause be discovered in that part of the bowel in the range of the examining instrument." "Diarrhoea is usually the main symptom of colitis; it may also be occasioned by new growths, a bowel filled with hard, impacted feces, strictures, ulcerations, etc."

In conclusion, Zobel mentions the simple apparatus necessary for a complete anorectal examination and calls attention to the delicacy of the procedure in passing the sigmoidoscope through the valve of O'Bierne, in examination of the higher portions of the colon, and the consequent need for gentleness and caution in manipulating the instrument.

More complete examinations and more considerate treatment in rectal work are also urged by E. G. Martin[2] in his paper, "Differential Diagnosis in Anorectal Disease," read before the Wayne County Medical Society. Like Zobel, he laments the fact that salves and suppositories for piles are given a patient, whether he has rectal hemorrhage, itching, or anal pain, without first submitting him to a thorough examination. He speaks hopefully, however, of recent progress in proctology within the last few years and the recognition of its importance.

### HEMORRHOIDECTOMY AND NON-OPERATIVE TREATMENT OF HEMORRHOIDS.

We find, among the German writers on the treatment of hemorrhoids, that Pozenel[3] still favors the ultra-radical operation of removal of the varices, as well as the whole hemorrhoidal plexus, by the Whitehead method. He says that in difficult cases the Whitehead operation deserves preference over all others, such as cauterization of the isolated tabs, dilatation of the sphincter, injection of carbol sublimate, or alcohol, ecrasement, ligature, or internal medication.

The Whitehead operation has been justly condemned by all proctologists, and the great majority of general surgeons have abandoned it altogether. It is mentioned here as a warning to young surgeons to whom this method of circular incision seems to have a strong appeal.

Boas,[4] on the other hand, inclines toward treatment. "While the operative method of treating hemorrhoids has for a long time attracted more attention and leads in most cases to cure," he says, "there has never ceased to be an inclination on the part of the patient toward a non-operative method." The method most familiar to the author and most approved by him, is injection with carbolic acid. He has used this for twenty years and not observed any complications. He does admit, however, that oftentimes there was a recurrence which made necessary a repetition of the treatments.

I formerly employed the carbolic method in selected cases, but now much prefer quinine and urea hydrochloride 5-10% solutions, as advocated by Tirrell. It has the same action on the hemorrhoidal tumors and has the added advantage of being a local anesthetic. If the precaution is taken to inject in the upper portion of the pile, no pain, sloughing, or oedema of the external skin will take place. If, however, the injection is made too low, some of the solution will infiltrate the contiguous external hemorrhoid, producing a very painful oedema.

Of the writers in this country, L. J. Hirschmann[5] is an exponent of hemorrhoidectomy under local anesthesia. "While practically every operation in the realm of proctologic surgery can be performed under local or regional anesthesia, there is nothing which has responded more satisfactorily to surgical relief under local anesthesia, than the radical treatment of hemorrhoids." He urges as complete preparation as though for general anesthesia, and a preliminary narcotic as of the utmost importance in allaying the fears of the apprehensive patient, and calls attention to the fact that a three or five-minute pause after injection will greatly enhance the value of the anesthesia; that failure to procure satisfactory results by some surgeons has been due to their anxiety to proceed before complete anesthesia has been induced. After circumanal anesthesia is complete, traction on four Pennington triangular forceps, which grasp the surrounding skin at the four points of the compass, everts the anus and exposes the internal hemorrhoids, if they have not already been prolapsed. These are now injected with a sufficient quantity of the solution to distend them one-half inch beyond their junction with normal mucosa. The most dependent hemorrhoid is grasped with forceps and drawn down in its long axis, then a right-angle-curved blunt-pointed ligature carrier threaded with No. 2 catgut is passed into, underneath and around the hemorrhoid at its juncture with healthy mucous membrane and tied. All the hemorrhoids are similarly ligated before excision to prevent operative hemorrhage. The hemorrhoids are then excised from without inward, care being taken to remove all the hemorrhoid, saving as much of the normal mucosa as possible, and cutting the pile away one-fourth inch below the ligature. The wound is better left open and nothing more need be done to it except trimming the excess mucous membrane in order to leave a longitudinal wound. If there is any oozing, the wound is united with a continuous running stitch."

The author recommends this operation as a simple, satisfactory and thorough one and gives with much detail the steps of the operation, with appropriate illustrations.

### PROLAPSUS RECTI.

T. Wingate Todd[6] considers the rectal prolapse of infants from an anatomical point of view in an article in the *Annals of Surgery*, 1920, giving as the reason for the frequency with which this affection occurs in children the relative position of the rectum with the bladder and uterus, in that the latter organs are higher at birth and later descend into the pelvis. This, together with the straight character of the sacrum in the infant, by reason of which the organ is not relieved from pressure of overlying viscera as in the more curved sacrum of the adult, puts the rectum at a mechanical disadvantage. He finds, however, no great laxity of the recto-sacral attachments in the infant than in the adult, and says, "In both, there is sufficient play in the rectal stalks to allow a certain limited prolapse in the presence of other accessory causative factors and without damage to the nerves and vessels themselves. In such instances the prolapse must obviously be temporary, and it would appear unnecessary to resort to operative measure for its treatment."

Turtle[7] reports a case of "Sudden Complete Procidentia Recti in a Young Adult Male." The patient was 26 years old and, except for the fact that when a very young child the rectum came down and had to be replaced, had had no trouble up to the day previous to admission to the hospital, when, during defecation, the bowel suddenly came down. The day after admission the mucous membrane of the prolapse (which was a firm, oedematous egg-shaped mass, 5x4 inches) was beginning to ulcerate in places and the entire prolapse was excised. There was incontinence of feces for one month, but two months after operation control had been fully established.

In this connection I recall a case of sudden, complete procidentia of the rectum occurring in a man about 35 years of age, following an alcoholic debauch. The whole rectum was protruded for four or five inches. It was thought that some radical procedure was indicated, but because of the condition of the patient, operation was postponed and the procidentia held in place by strapping the buttocks After the patient was able to be about, it was found that the sphincters had firmly contracted, and, so far as I am aware, there has never been any further prolapse. I heard from him four or five months later and at that time the rectal condition was good. This would suggest the advisability of trying palliative treatment in all cases of procidentia of short duration.

Speed[8] demonstrates a case of a male 40 years of age, who had had a protrusion, appearing five years previously and reappearing frequently and increasing in size. For a month it had not been reducible and there was bright red blood at stool. There were no hemorrhoids on the extruded mucous membrane and no ulcers, the slight amount of hemorrhage coming from the granulating surface. All the bowel coats had descended, but the sphincter had not lost its power; it still grasped slightly. Speed's method of treatment in this case was, first, to sear the mucous surface in the direction of the longitudinal axis of the bowel with the edge of the glowing cautery knife, making several of these linear cauterizations, always in the long axis, and burning through the mucous surface and the deeper tissue and passing across both sides of prolapsed fold; and then, when these burned lines were complete, reduction of the extrusion into the rectum, keeping it reduced and held in normal position, and the anus sewed up with a pursestring suture for seven days. "When the eschar sloughs and granulations with cicatrization follows along each of these burned lines, we may reasonably hope to obtain firm adherence of the mucous surface to its supporting tissues. No stricture can follow because the burns have been in the longitudinal axis, but the cicatrization will cause some tightening of the rectal lumen, and with the rectum held in normal position and the anus sewed up, at the end of seven days the sphincter will have regained its power." Speed's patient left the hospital after three weeks and up to that time there had been no recurrence, nor had he returned to the hospital up to the time of reporting the case, as requested to do if there was any sign of the old disturbance.

### IMPERFORATE ANUS.

A. D. Bevan[9] and C. Skinner[10] each report one case of imperforate anus in a new-born child. In both cases there was communication between the bowel and the urinary bladder. In Skinner's case, a colostomy was done six hours after birth; the child lived three weeks and appeared to be doing fairly well, but rapidly failed after that, and died within two days. This author says of this type of case that the majority of these children are defective in other portions of the anatomy and nearly all of them die. In Bevan's case, the blind end of the rectum and bladder formed one large cloaca, and he lays stress on the danger of death from ascending nephritis under these circumstances unless an immediate colostomy is performed. Skinner's intention was a temporary colostomy, and after the child had recuperated, to make an effort to establish the normal opening. Bevan, however, thinks it preferable to have an inguinal anus, as attempts at dividing the bladder and rectal cavities and attempting to make a new rectum in normal position have not been successful, and any result obtained will probably not function as satisfactorily as an inguinal anus.

### GLANDULAR POLYP.

Among the French writers, Henri Blanc[11] reports a case of giant glandular polyp of the rectum. The patient was a neuro-arthritic, 57 years of age, with digestive troubles suggestive of enterocolitis, as well as persistent tenderness in the right side, progressive emaciation, and a right inguinal hernia. He was operated upon 12 years previously for anal fistula and at the same time the hernia was repaired and an appendectomy done. Following this operation the patient was much improved, but at the end of four years appeared again complaining of local disturbances, consisting of two movements every morning, the first of which was nearly always large, glairy, and whitish, but never bloody; the other, nearly normal; and towards the end of the day and sometimes during the day, the passage of large, glairy, whitish masses without any fecal matter. Some days the effort of voiding urine brought about an involuntary expulsion of rectal secretion.

Palpation disclosed a very irregular, flabby mass, on the anterior half of the rectal wall, about 9 to 10 cm. above the anal orifice, giving the impression of a spongy mass issuing from the rectal wall. Rectoscopy gave the diagnosis: Multiform glandular polyp, of vilous tumor type, perfectly benign in character. Rectoscopy showed, in fact, a series of tumors, resembling in shape and appearance an elongated strawberry, without ulcerations, or hemorrhage, and forming together a tumor with multiple, irregular fringes, soft, and attached to more than half the circumference of the intestine. One of these fringes was excised during rectoscopic examination, and microscopic diagnosis confirmed the diagnosis.

At operation the polypous fringes were excised nearly level with the mucosa. Following operation there was considerable relief and all the rectal discomforts disappeared; but at the end of six months reappeared and another examination showed some polypous fringes still existing. Under local anaesthesia the last vestige of the polyp was resected to the level of the mucosa. Examination of the portions resected showed, as before, that the tumor was benign.

### HEMORRHAGIC AND PURULENT RECTOCOLITIS.

Edouard Antoine,[12] in an article entitled "Quelques Formes Cliniques des Recto-Colites Hemorragiques et Purulentes," has given the results of attempts to isolate the pathogenic microörganism of the three types of hemorrhagic and purulent rectocolitis, which he classifies as follows: (1) hemorrhagic rectocolitis (rectocolitis with hemorrhages predominating); (2) purulent rectocolitis (purulence predominating), and between these two groups a series of intermediary cases; (3) hemorrhagic purulent rectocolitis.

Antoine cites a case of each type and goes on to say, "These three clinical aspects of hemorrhagic and purulent rectocolitis do not resemble in any respect already known dysenteric or dysenteriform conditions. Moreover, they present a certain number of common characteristics which make it proper to group them: at the very beginning a short, ill-defined subfebrile attack of gastroenteritis, occurring in patients with marked constipation; from then on, intestinal hemorrhages or purulent evacuations, which may occur alone, alternately, or associated, and which make up the different clinical types that we have described. There may even be absence of the dysenteric syndrome: no pain, no fever, no mucus, no marked deterioration in the general condition. Finally, there may be even a chronic evolution—an illness of a hopeless persistency, momentarily relieved, but coming on again in spite of every medical treatment employed. There then seems to be a question of deep infection of the mucosa of the terminal portion of the large intestine by a tenacious microbe, or one which re-infects this region periodically under little known influences. Moreover, it is to be noticed that the anatomical lesions revealed by rectoscopy are similar although of variable degrees. Sometimes one sees intense congestion of the rectal mucosa, with small, intensely vascular petechial spots. With the affection at a more advanced stage the spots become confluent, often attaining blotches of hemorrhagic suffusion of great size. Then, sometimes there is an oedema of the mucosa and the congested spots are like ulcers covered with a muco-purulent coating. In all these cases the mucosa seems very thin and bleeds at the least contact. These lesions explain perfectly the frequency and the predominance either of hemorrhage or pus. We have not found actual ulceration."

"Practical and repeated research for ameba, spirilla, or other intestinal parasite have remained absolutely without result. Our patients did not show any sign of syphilis or tuberculosis; the Wassermann was negative; nor were there any signs of intoxication by urea or by medicaments (mercury, arsenic, colchicum, etc.). Finally, serum agglutination tests by Eberth's technique, both for paratyphoid and dysentery bacillus, remained constantly negative. Our microscopic examinations have shown, however, in all these cases, constantly and distinctly, an infection of the rectocolon by abundant polynuclears, often in a condition of phagocytosis. Bacteriological research begun in this way has permitted us to find the constant presence of the pathogenic germ so that we have been able to isolate it, and are now in the process of identifying it and experimenting with it."

### GUN-SHOT WOUNDS.

Among the articles on war surgery is Arthur Keith's[13] "Gunshot Wounds of the Great Bowel and Rectum." Specimens showing the nature of bone injuries accompanying wounds of the pelvic viscera and the widespread effects of modern missiles of high velocity were shown by him at a meeting of the Royal Society of Medicine, and, following the exhibit, Sir Gordon Watson, in discussion, noted the fact that injuries in this region are very frequently followed by infection of the pelvic cellular tissue and are then extremely fatal, and that for this reason colostomy is advisable for all wounds of the rectum. The high mortality of rectal wounds is due to the fact that they are complicated by wounds involving the bony pelvic wall, bladder, intestines, buttocks, hip-joint, etc. He advises colostomy even though small intra-perineal wounds may be sutured; and in large lacerated wounds, which are usually associated with perforation of the small intestine and extensive injury to the pelvic wall, the mortality is so high that in some instances an abdomino-perineal excision has been performed in the hope of preventing acute sepsis. Purely extra-perineal wounds require free excision of the soft parts and liberal drainage of the damaged bowel in addition to colostomy. Perineal wounds involving the anal canal without peritoneal injury should be treated like fistula by free excision and division of the sphincter.

REFERENCES.

[1] Zobel, A. J.. The Diagnosis of Anorectal Diseases. Am. Jour. Surg., 1920, xxxiv, p. 34.
[2] Martin, E. G.: Differential Diagnosis in Ano-rectal Disease. Jour. Mich. State Med. Soc., June, 1920.
[3] Pozenel, H.: Die Radikal-Operation der Hämorrhoiden. Wien. klin. Wochnschr., 1919, xxxii, p. 1003.
[4] Boas, I.: Die Radikale Heilung der Hämorrhoiden auf Unblutigen Wege. Deutsche med. Wchnschr., 1919, xlv. p. 1153.
[5] Hirschman, L. J.: A Successful Hemorrhoid Operation under Local Anesthesia. Am. Jour. Surg., 1920, xxxiv, p. 58.
[6] Todd, T. W.: Anatomical Considerations in the Rectal Prolapse of Infants. Ann. Surg., 1920, lxxi, p. 163.
[7] Turtle, W. R. M.: Case of Sudden Complete Procidentia Recti in a Young Adult Male. Lancet, 1920, i, p. 153.
[8] Speed, Kellogg: Prolapsus Recti. Surg. Clin., Chicago, 1920, iv, No. 1, p. 61.
[9] Bevan, A. D.: Imperforate Anus. Surg. Clin., Chicago, 1920, iv, No. 1, p. 21.
[10] Skinner, C.: Imperforate Anus: Case Report. Kentucky Med. Jour., 1920, xviii, p. 178.
[11] Blanc, H.: Polype glandulaire géant du rectum. Paris Chirurg., 1919, xi, p. 192.
[12] Antoine, E.: Quelques formes cliniques des recto-colites hémorragiques et pufulentes. Gaz. d. Hôp., Par., 1919, xcii, p. 769.
[13] Keith, A.: Gunshot Wounds of the Great Bowel and Rectum. Proc. Roy. Soc. Med., 1918-19, xii, Sect. Surg., p. 47.

* * *

Two Days' Conference Indicates Broad Anti-Tuberculous Program. — The range of subjects discussed at the Seventh Annual Conference of the Massachusetts Tuberculosis League, held in Boston, May 13 and 14, indicates that anti-tuberculosis societies of the state have adopted a broad public health program and are especially stressing preventive work with children. More than half of the time of the convention was taken up with the discussion of nutrition work and means and devices for making the teaching of personal hygiene attractive and effective with children. Such speakers as Dr. W. R. P. Emerson of Boston and Dr. Henry D. Chadwick, Superintendent of the Westfield Sanatorium, declared that the most promising means for the real prevention and control of tuberculosis lies in the field of the pediatrician and that, without doubt, the most effective effort in this field is intelligent, adequate attention to the mal-nourished child.

The report of the work of the League showed great activity during the past year. Money has been raised in nearly every city and town of the Commonwealth for the support of voluntary anti-tuberculosis work. As a result of this support, active programs touching every community in the state are rapidly being established. The state is being organized on the county and district unit plan outside of the larger cities. This enables the employment of expert paid service which is now coöperating with the state and local authorities and other health agencies in work for the prevention and control of tuberculosis.

The Modern Health Crusade in the public schools, work with under-nourished children, tuberculosis surveys, and consultant clinics, in addition to a continuous program of health education, are now being carried on by many of these organizations. As Commissioner Kelley remarked, "there does not seem to be a lessening of interest in tuberculosis, but rather a deepening and broadening of ideas of the program which must be carried out in order to control the disease"

The constitution of the League was amended so that hereafter governmental authority will be vested in a board of directors, a majority of whom will be elected by affiliated organizations, thus insuring responsive democratic government.

The following officers were elected for the coming year: For President, Dr. Edward O. Otis of Boston; for Vice-President, Mr. Henry S. Dennison of Framingham; for Honorary Vice-Presidents, Dr. Walter P. Bowers of Clinton, and Dr. Eugene R. Kelley of Boston; and for Treasurer, Mr. Arthur Drinkwater of Cambridge; for members of the Executive Committee to serve for three years, Dr. Parker M. Cort of Springfield, and Dr. Francis P. Denny of Brookline.

* * *

Massachusetts had 678 cases of diphtheria and forty-four cases of typhoid fever in April, 1921—arguments for the Schick test and antityphoid treatment.

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## THE ONE HUNDRED AND FORTIETH ANNIVERSARY OF THE MASSACHUSETTS MEDICAL SOCIETY.

THE meeting this year was limited in scope, because of the demands on the time and energy required of many members in providing for the voluminous sessions of the annual meeting of the American Medical Association in Boston. The Council meeting was held on Tuesday, May 31st, at 5 P.M., and the time required for the transaction of business was over two hours. This meeting was attended by a large number of members who showed unusual interest in the executive affairs of the Society. This meeting will be reported separately.

The Shattuck Lecture by Dr. Haven Emerson, was a scholarly presentation of the practical problems incident to the prevention of heart disease.

The presentation of a proposed change in the by-laws at the general meeting Wednesday morning, developed doubt as to the effect on the election of officers of the Society involved in the wording, and therefore action was postponed. While it is clear that officers who are already members of the council would be eligible for re-election, there may be a question as to the legality of electing officers in the future who might not be members of the council at the time of an election. The President raised the question of the desirability of continuing the custom of sending delegates to meetings of other state societies, because of apparent disinclination of some fellows to accept this responsibility. It was, however, the opinion of several fellows that the custom was of distinct value and no action was taken.

The first paper read, by W. P. Bowers, was, to some extent, a résumé of facts and arguments which are under discussion relating to maternity benefits and infant welfare, but presented, in addition, a plea for this state to develop and and control activities which may result in better conditions, and brought out the influence of the incidence of syphilis in causing still births and infant mortality and morbidity. The underlying recommendation being that every effort should be made to secure unanimity of opinion in the profession as to the best methods to be employed for the purpose of securing better results, which seem to be demanded.

Dr. S. B. Woodward forcefully presented the history of the efforts to secure better vaccination laws, and showed the lack of logic exhibited by the opponents. His address abounded in pointed illustrations of the weaknesses of arguments against vaccination and the reasons for active support of efforts to save the people from the dangers of ignorance and prejudice. His work on legislative committees and exhaustive study of the subject entitles him to speak with authority.

Dr. Goldthwait, in his address, brought out the great need of educating the children how to develop sound and effective bodies, drawing illustrations from the 46 per cent. of defective men from this state in the late war, and clearly differentiated the various types of children, showing the tendency of each group to fall into habits of posture and bodily carriage which not only decrease efficiency, but induce disease. Photographs of the different types illustrated both the natural build of certain defective children and the fundamental principles involved in correcting them. He clearly explained the problem involved, which is very simple and which, if understood and applied, makes such great improvement in health and efficiency.

Dr. Edsall contrasted the American conception of premedical and medical study with that of Germany, for example, and brought out the different ideas of students of these questions. In contrasting our scheme with that of Germany, he explained that whereas a youth in this country could go through our lower grades and be left free to take up any study afterward, the German child was restricted in his early years to the amount and character of the courses, according to definite purposes.

In considering medical education, it was explained that students have so much work imposed on them in the medical schools that they should have mastered the elementary subjects of chemistry and biology before taking up the study of medicine, for the inadequately developed mind was handicapped and had to devote time to the fundamental branches, thereby becoming confused and distracted. The effect of Dr. Edsall's address should be to lead physicians to use all possible influence in urging prospective medical students to secure a sound education in fundamental subjects, before entering upon the study of medicine.

The annual address, delivered by Dr. Anthony, was original in scope and ideas. He presented a plan whereby physicians may be relieved of a large proportion of unremunerative work, and the people much more efficiently served. Under this plan it was shown that physicians contribute millions of dollars worth of services to those who cannot afford to pay, but that under state hospitals, the expense to the state would not be extravagantly large, and physicians would be relieved. This address was published in full in the Journal of June 2.

The annual dinner was attended by about two hundred fellows and guests. It was both enjoyable and inspiring. The President introduced the speakers in a most graceful manner.

The Governor brought a message of encouragement from the Commonwealth and suggested that physicians being in close contact with the people, could treat effectively the public mind so that the spirit of discontent often observed, might be dissipated, and citizens brought into normal relations with the great needs of the present time. The greatest opportunities exist for public service, and every person should be brought to realize the responsibility of taking up burdens which individuals can carry better than the government. Setting people right by influencing them to meet rightly civic responsibility, will keep Massachusetts in the lead among the states of the Union.

Mayor Peters, introduced as the representative of the Hub, spoke of the great influence of the Society through many years and of the inindividual physicians who have always contributed to the efficiency of the various health agencies of the city, and in private practice had done so much for the poor, without reward. He brought out the diversity of work in the six departments which function in promoting and protecting the health of the city and compared the efficiency of preventive medicine to forms of insurance. The scarcity of trained sanitarians was deplored, and the question raised as to whether this resulted from inadequate training in the medical schools or the low financial inducements. He paid an eloquent tribute to Professor Sedgwick, who had served the city as chairman of pauper institutions. Emphasis was placed on the need for medical service in conducting a war which, unlike the World War, must go on.

Dean Roscoe Pound was presented as a representative of the legal profession, who humorously alluded to the suspicion that professional men were members of trusts. His wit and logic gave force to the narration of many of his experiences. The attitude of the lay mind toward the professions, tending to suspicion, seemed to him to be founded on the consciousness of lacking something possessed by lawyers, physicians and the clergy, so that it was natural that an uninformed person might be indifferent to the benefits of law or even attempt to cure himself by self-prescribing. When the populace ceases to make use of gibes at the professions, the millenium will have arrived, and no one will need doctor or lawyer, and the problems of man's spiritual needs will have been solved.

The Society was honored by the presence of Dr. Hubert Work, President of the American Medical Association, who is now assistant Postmaster-General. In answer to the question of President Worcester as to why physicians have to pay postage when congressmen have franking privileges, Dr. Work affirmed that a man on trial was not obliged to give testimony which might be prejudicial to his case. He felt that Massachusetts was in good hands, but concluded that Boston is not a city but rather a state of mind. Referring to remarks of previous speakers, he said that there was no fear of a trust, for lawyers never trusted medicine, but medicine trusts everybody.

Responding for the clergy, the Rev. George A. Gordon, D.D., based his remarks on quotations from the classics in the time of Hippocrates, and contrasted the lack of reverence for the doctors in this more modern country to that shown in his native land of Scotland, where the people regarded the physician as not only a friend, but as a man of dignity and influence. He brought out the antiquity of simple but effective means of promoting and conserving health in the use of fresh air and water. Quoting the phrase that life is short and science is long, he developed the thought that each one has the privilege of building his brief life into the light of science, and that we live in critical times, requiring clear vision. We must realize that experience is slippery and judgment is difficult, but that the judgment which enables a person to hit the nail on the head is a stroke of genius. Referring again to his native land, the respect shown to doctors was earned by gentlemen of science, and that, above all, the people loved the schoolmaster, the minister and the doctor.

The President next introduced one of the modern heroes of medicine, a man who had given up many of the comforts of life, had isolated himself, together with a group of unfortunates who are shunned by society and kept in quarantine, Dr. Parker, physician for many years to the lepers on Penikese Island.

The members rose and bowed in tribute to this modest, high-minded and devoted man, a type of the true physician. To many, this was the most impressive feature of the meeting.

Dr. Henry P. Walcott, long a leader in the profession, the man who made the Massachusetts Board of Health a model for and inspiration to the other states in the Union, responded briefly, thanking the profession for its confidence and support for many years.

The President then introduced his successor, Dr. John W. Bartol, of Boston, who briefly thanked the Society for the honor conferred, and pledged his earnest effort in behalf of the Society, asking especially for support in meeting the problems involved.

Dr. Bartol was born in Lancaster, January 10, 1864. His father, the Rev. Dr. Bartol, served the first parish of Lancaster through one of the longest pastorates in Massachusetts. His mother was Elizabeth Washburn. He was educated in the public schools, fitted for college at Exeter Academy, and graduated from Harvard College in 1887. He graduated from the Harvard Medical School in 1891, and was house officer in the Massachusetts General Hospital on the surgical service, but has devoted himself to general medicine. He was formerly visiting physician to the Boston City Hospital and a member of the State Board of Health from 1902 to 1907. He entered the service in June, 1917, and was honorably discharged in June, 1919, with rank of Major. To his associates, nothing need be said. The Society will have the service of a mature mind and a judicial temperament.

## THE RELATION OF THE ORTHOPEDIC SURGEON TO THE GENERAL PRACTITIONER.

However ample the attainments of the general practitioner, or prompt his sagacity in recognizing diseases and their curative conditions, all must be aware that there are times when the outside help and advice generously at hand and unselfishly given, is of the greatest importance and assistance, not only to the practitioner, but to the patient.

It is in this latter rôle that the orthopedic surgeon stands in relation to general medicine, not leaning either towards the side of acquiring the patient permanently, or towards the side of offering inadequate service or advice, but in the spirit of coöperation for the good of the patient. There are many ways in which the orthopedic surgeon and the man in general practice may be of great mutual help, and if proper advantage is taken of the opportunities offered to each alike, much benefit will accrue therefrom.

To cite instances where such assistance might be properly called for, one would only need to recall the difficulties and confusion occasionally arising in the early diagnosis of osteomyelitis for one; another, early bone and joint tuberculosis; and in general, the treatment of fractures when in such cases many helpful hints in mechanical technique may prove useful.

The recognition and interpretation of conditions of the back, arising either from congenital, acquired, or traumatic causes, is a large field also where the orthopedic surgeon could bring his advice and special knowledge to the aid of the family physician in establishing a diagnosis and outlining the proper treatment.

No one specialty has done more to advance the knowledge and adequate treatment of anterio-poliomyelitis than orthopedic surgery, and the general practitioner would gain useful and helpful knowledge for himself and his patient by consulting such sources.

Congenital deformities, such as club feet and dislocation of the hips, often suffer from neglect until a proper result is impossible of attainment by recognized methods, leaving the patient permanently disabled. Early recognition and treatment result, generally, in early cures, and the knowledge of these methods of treatment can only be gained by consultation with those trained by daily contact with such problems.

Further enumeration is unnecessary, but many other bone and mechanical problems suggest themselves.

The orthopedic surgeon sees many border line cases where the advice and assistance of the general practitioner is necessary in making a diagnosis and outlining a course of treatment which is appropriate for that individual case and without which, such help could not be properly carried out. The factors of home life and environment are generally unknown to the orthopedic surgeon, and can only be supplied by consultation with the family physician.

Just as the orthopedic surgeon turns to the laboratory man for his vaccines and bacteriological and pathological assistance; to the nerve specialist for help in obscure cases, and to the gynecologist and genito-urinary surgeon for aid in the interpretation of obscure backaches; so the orthopedic surgeon should be ready to do his part in trying to solve some of the problems for the general practitioner.

What is the point of view of the general practitioner? Given a case of back strain, which does not get well with the usual strapping; a club foot; a wry neck; a scoliosis; a bad fracture; what is he to do? Should he continue to treat these cases rather than send them to some one who can treat them more adequately? If the condition is one which needs laboratory assistance and diagnosis, there is no hesitation, but the fear of losing the patient is the deterrent factor otherwise. This should not be so, and no patient need be lost except for the time being, and for the length of time necessary for adequate diagnosis and treatment. Family physicians are too strongly seated in the homes of their patients, to be forced to take a part in the general dethronement which is now going on, or to have any fear of losing anything by supplying adequate service.

There should be more general coöperation and consultation between the general practitioner and the orthopedic surgeon, not only for the rendering of adequate and early service to the mechanically afflicted, but for the mutual instruction and friendship gained thereby on the part of the medical consultants.

* * *

## SUMMARY OF PROF. CHAGAS' WORK.

On May 26 and 27, Professor Carlos Chagas, Director of Oswaldo Cruz Institute, Rio de Janeiro, Brazil, gave three lectures at the Harvard Medical School upon the new disease, American Trypanosomiasis, first described by him.

The infectious agent is the Trypanosoma Cruzi. Chagas believes that the natural host of this trypanosome is an armadillo, tatusia novemcincta, which is abundant in the interior regions of Brazil. The holes in which this animal lives are infested by a species of triatome (triatoma geniculata), which may emigrate to human habitations, and in the intestines of which Chagas found the Trypanosoma Cruzi.

The most frequent intermediate host, however, is the "barbeiro," or triatoma megista, an insect somewhat like a bedbug. A large majority of the crude dwellings of the poor in the interior of Brazil are infested by the "barbeira." The insect is difficult to eradicate, is fairly long-lived, and is infectious throughout the three stages of larva, nymph, and adult insect

When the "barbeiro" sucks blood from an infected individual, it takes into its intestinal tract the trypanosome. If the trypanosome is in the flagellate form, it loses its flagellae and undergoes multiple divisions to form crithidia. These latter are found in the salivary glands of the insect. In other cases, if the blood of the infected individual contains the trypanosome in its "male" and "female" forms, these appear to unite in the gut of the "barbeiro," to result in the form which is also finally found in the salivary glands of the insect. Thus the "barbeiro" transmits the infection from one individual to another.

In the infested regions, it happens that infection occurs most frequently in babies and young children. The clinical picture is that of an acute infection. There is fever, lasting between ten and thirty days. The liver and spleen enlarge, the lymph glands swell, and the face presents a peculiar, almost pathognomonic myxedematous infiltration. During this phase, trypanosomes are found in the blood. They invade, practically, all the glands of the body, but show predilection for the nervous system and for striated muscle. Invasion of the meninges and of all parts of the central nervous system is the chief cause of death in acute cases; in chronic cases, it may result in all grades of mental deficiency. After the acute febrile period is over, the trypanosomes disappear from the blood, and invade the tissues. The heart muscle is very frequently affected, and the degeneration in the myocardium set up by this invasion, results in arrhythmia and heart block. Cardiac involvement is the most frequent cause of death in the chronic cases. Stokes-Adams syndrome is met with in young children, and sudden death may occur in apparently healthy young adults from this cause.

In addition to the above effects of trypanosomiasis, Chagas speaks of infantilism and myxedema as being due to the invasion of the thyroid by the trypanosome.

G. G. Smith.

* * *

## REPORT OF COMMUNICABLE DISEASES

There is considerable variation in the practice of reporting diseases dangerous to the public health by physicians. Some members of the profession are businesslike, prompt and efficient in meeting the requirements of the Department of Public Health, some are inclined to wait for very evident indications of disease, and a few are careless and indifferent. Those who are careful in making a diagnosis are, as a rule, most loyal to the regulations in force. The careless ones are of two classes, practitioners who are busy and, perhaps, overworked, and those who have never developed high ideals of practice or personal conduct.

The situation in New York has led to especial reports in the Bulletin of the Department of Health, and pleas for better service. A number of physicians have shown marked disregard of the requirements, and have been sued. Heavy fines have been imposed and the court action and publicity have caused great inconvenience and humiliation.

In Massachusetts, the State Department and local boards have been most lenient, and every effort has been made to secure coöperation rather than to resort to compulsion or prosecution. In a recent case, it was found that a physician had completely ignored the existence of diphtheria. The first patient of a series died, after presenting the typical signs of suffocation. The diagnosis was pneumonia, but cultures taken from the dead child showed the presence of diphtheria bacilli, and other children in the family developed the disease. The State Department tried to induce the attending physician to revise the death return, but this he refused to do. Instead of entering a suit, the Board of Registration in Medicine was asked to act. After a hearing, the Board suspended the license of the physician in question. One feature of the defense in the case was the concerted effort of other physicians to make it appear that the death might have been due to pneumonia and that the attending doctor may have met all the symptoms by his diagnosis and treatment. It is hoped that the State Department of Public Health will not find reason for other complaints.

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## MEDICAL NOTES.

New Hampshire Medical Society. — The one hundred and thirtieth annual meeting of the New Hampshire Medical Society was held in Concord, May 25 and 26. Dr. F. B. Lund, a native of New Hampshire, attended the meetings and read a paper entitled, "Ulcers of the Stomach." Dr. W. B. Cannon read a paper in which new evidence regarding the control of the thyroid gland was presented. Dr. Richard S. Eustis read a paper on the "Problem of Heart Disease of Rheumatic Type." The meetings were very well attended and many papers of great merit read. Dr. Charles S. Walker was elected President for the ensuing year.

Dr. Rawlings, director of the Illinois State Department of Health claims that in his state alone, there will probably be more deaths of infants in three years than this country lost soldiers from all causes during the World War. Other states are contributing an equal proportion to this frightful mortality. Hasten the day when Massachusetts will have infant welfare work efficiently carried on in every community.

Uncle Sam's Model Village.—Every town should send to the United States Public Health Service for details of methods used in developing a model village on a 516-acre tract at Perryville, Md. The birth rate exceeds the average throughout the state, the death rate is low, communicable disease carefully managed, and all matters pertaining to health carefully regulated. This demonstration should be used as an incentive to provide ideal conditions everywhere.

A Study of Maternal Mortality in New York City by William Travis Howard, Jr., of Johns Hopkins University, shows that in the city of New York, over a five-year period, the death rate from puerperal septicaemia is 14.41 per 10,000 labors, whereas in Boston the rate is 24.03. In 1919, the rate in New York was brought down to 11.41. The death rate among mothers who had received prenatal care was .24 as compared with .45 for the city at large. There was also a reduction in the rate of infant deaths of fifty per cent. among those born of mothers under such care. New York thereby challenges Boston.

Dr. Frederick L. Hoffman, third vice-president and statistician of the Prudential Insurance Company, has accepted an invitation to join the Mulford Biological exploration of the Amazon Basin, under the direction of Dr. H. H. Rusby, which will leave for the west coast of South America on the S. S. *Santa Eliza*, on June 1st. The general purpose of the expedition is to seek new information concerning useful drugs and ingredients of value to medical and pharmaceutical science. Dr. Hoffman's work will concern the health, longevity, acclimatization and sanitary progress of the regions visited, particularly as regards American residents, temporarily or permanently settled under the conditions of tropical life. His investigations will amplify the research work of the Harvard School of Tropical Medicine and of the American Geographical Society, etc. Attention will be given to the effect of high altitude on health and longevity, and in the Amazonian lowlands to the prevailing tropical diseases, especially the various types of malarial fever. The expedition will probably take two years or more, but Dr. Hoffman's work will practically terminate at Manaos, Brazil, and actually come to an end at Para, from whence he expects to return to this country some time in the fall. The results from a life insurance point of view should be of value in perfecting the tropical rating practices of companies which accept risks on American residents in tropical regions. With the growth of American commerce throughout South and Central America, the question of an equitable rating practice is becoming one of serious concern. Dr. Hoffman will have the coöperation of the Pan-American Union and of the diplomatic and consular offices throughout the section to be visited. He recently prepared an exhaustive discussion of the sanitary progress of the Pan-American Republics, which will be published by the Pan-American Union in the near future.

Certified Water on Steamships.—Another step toward insuring travellers on interstate carriers against the evils of polluted drinking water was taken on April 15, when the laws already in force in regard to railway trains were extended, with necessary modifications, to steamships on lakes and rivers, and between United States ports and ports of adjacent countries. Henceforward, water used on such vessels for drinking or cooking, must be obtained on shore from a source approved by the U. S. Public Health Service, usually acting in coöperation with State health authorities, or must have been treated by a method approved by the Service. If not obtained ashore, the water must be treated on board ship by an approved method. All water-piping systems on shipboard are required to be so arranged that no connection can be made between the drinking water pipes and pipes for any other water system. Every tap or other source yielding water unsatisfactory in safety or quality is required to be marked by properly placed signs, approved by the Public Health Service, stating that the water is unfit to drink. By these regulations, it is hoped to prevent outbreaks of typhoid fever and dysentery.

The common belief that botulinus poisoning is associated only with the use of olives must be combatted, for a fatal case developed recently in Seattle, after ingestion of string beans. The canning was according to approved methods. Physicians should warn people of the danger of using canned vegetables which show the slightest indication of decomposition. A very small amount of food infected with the bacillus botulinus may be fatal.

Brooklyn Cardiological Society. — The fourth meeting of the Brooklyn Cardiological Society was held at the office and residence of the president, Dr. William J. Cruikshank, 102 Fort Green Place, Brooklyn, N. Y., U. S. A., on Monday evening, May 23rd, at 8.30 o'clock. Program: Address, "Cardiac Murmurs and Their Relation to Organic Heart Disease," by Dr. Lewis A. Conner, Manhattan. Discussion opened by Dr. Glentworth R. Butler.

Note—Dr. Richard S. Cabot is an honorary member of this Society.

New Tuberculosis Hospitals.—An outline of the construction plans for the tuberculosis hospitals, so much needed for the treatment of ex-service men, will soon be published by the U. S. Public Health Service. In the preparation of these plans, valuable assistance has been rendered by T. B. Kidner, of the National Tuberculosis headquarters. Copies of the publication may be had by application to the Surgeon General of the Public Health Service.

Prescribing for a Sick Stream.—An intensive study of stream pollution with special regard to the establishment of a general plan by which any polluted stream in the United States might be purified at a minimum expense, has recently been begun by the United States Public Health Service.

As is well known, a polluted stream tends to purify itself, but its pollution in this direction depends on the amount and character of the original pollution, on the volume and speed of the current, and on the extent to which new pollution is added along its course.

The Service has selected for study the Chicago Main Drainage Channel and the Illinois river (which empties into the Mississippi), chiefly because all the primary pollution of this stream originates in Chicago and is accurately ascertainable, both as to amount and character. Analyses taken along the course of the canal and river will determine the degree and nature of the changes that take place in it. Where new pollution is added, its amount and character must be ascertained; and its effect on the old pollution learned. This last is important, for it is quite possible that sundry industrial waste might neutralize each other, or might destroy certain types of organic pollution.

The work in Illinois is in immediate charge of J. K. Hoskins, Associate Sanitary Engineer of the U. S. Public Health Service, and is under the general supervision of Surgeon W. H. Frost.

New England Society of Psychiatry Meets at Northampton.—The semi-annual meeting of the New England Society of Psychiatry was held at the Northampton State Hospital, Wednesday, May the fourth. The members were guests of Dr. John A. Houston, Superintendent of the Hospital. Dinner was served, following which the meeting was held, Dr. Walter E. Fernald, President, presiding.

Dr. Arthur H. Ring of Arlington Heights, read a paper on "Suicide." Dr. Warren Stearns of Boston, on "Suicide in Massachusetts," and Dr. Walter B. Cannon, Professor of Physiology, Harvard Medical School, on "The Present Limitations of Our Knowledge of the Endocrine System."

Sixty members and guests attended.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston. — During the week ending May 28, 1921, the number of deaths reported was 213 against 217 last year, with a rate of 14.60 against 13.99 last year. There were 30 deaths under one year of age, against 47 last year.

The number of cases of principal reportable diseases were: Diphtheria, 76; scarlet fever, 32; measles, 87; whooping cough, 15; typhoid fever, 1; tuberculosis, 70.

Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 8; tuberculosis, 20.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 2; whooping cough, 1; typhoid fever, 1; tuberculosis, 13.

Included in the above were the following cases of non-residents: Diphtheria, 2; scarlet fever, 1; whooping cough, 1; typhoid fever, 1; tuberculosis, 1.

Dr. W. G. Rowe, of England, the noted neuro-psychiatrist, who attended the medical conventions in Boston, will visit Washington on June 9, to confer with the Surgeon General of the Public Health Service and with the Director of the War Risk Bureau, in regard to mentally disabled American soldiers. Later, he will go to Perryville, Md., where the Service keeps its great medical stores, to attend a clinic at the large Public Health Service Hospital there and to familiarize himself with the types of cases under treatment. On June 11 he visited Atlanta, Ga., to attend the meeting of the American Psychopathological Association. While in Boston, Dr. Rowe read a paper on the biological significance of mental disease, at the meeting of the American Medico-Physiological Association.

Typhoid Fever in Waltham.—The recent epidemic of typhoid fever in Waltham reported to have been the result of using milk from one dairy, should be employed as an argument for the greatest care in the use of this most important article of food. The great difficulty in dealing with a milk-borne disease is that before the source is determined, many may be infected. Although typhoid is being largely controlled, these deaths show that great care must be exercised by individuals, for health authorities can often only act after evidence of the disease is apparent.

Dr. Normal M. Hunter of Hudson, has been appointed medical examiner of the Ninth Middlesex District. The towns comprising this district are Hudson, Maynard, Stow, and Sudbury. Herbert A. Rockwell, of Amherst, has been appointed medical examiner of the Third Hampshire District.

Exemption Certificates for Admission to Schools without Vaccination. — The School Board of Haverhill has shown commendable courage and devotion to duty in requiring repeated certificates stating that the condition of pupils warrants omission of vaccination. The Supreme Court has handed down a decision setting forth that such requirement is legal and thereby sustained this contention of the Board. School and health authorities have been fearful that such requirements could not be maintained. The way is now clear for better protection against smallpox. The anti-vaccinationists will undoubtedly try to have the compulsory features of the law done away with. The profession must be alert and the people warned in advance.

Dr. Eugene R. Kelley has been elected President of the State and Provincial Health Authorities of North America. Dr. Kelley has shown unusual ability in organization and constructive work in our State Department of Public Health. His diplomacy has been in evidence during trying periods of his administration, and his courage and patience in dealing with complicated situations has reflected loyal devotion to the best interests of Massachusetts.

Massachusetts is Honored by the election of Dr. Hugh Cabot to the Deanship of the University of Michigan Medical School. This elevation of our esteemed fellow is a fitting evidence of appreciation of his natural ability and acquirements, attained by unremitting study and hard work.

Dr. Cabot brings to this position a mind developed through extensive practice in surgery and the study of the principles and rules of teaching. His address before the Chicago Convention, earlier in the year, demonstrated a grasp of the problems involved in medical education. His administrative capacity was shown during the late war as O. C. of General Hospital 22, British Expeditionary Forces, with the rank of Lieutenant-Colonel. He was made a companion of the Order of St. Michael and St George.

The University of Michigan Medical School has gained prestige by this selection of its Dean.

Week's Death Rate in Boston.—During the week ending June 4, 1921, the number of deaths reported was 157 against 183 last year, with a rate of 10.81 against 11.81 last year. There were 21 deaths under one year of age agoinst 28 last year.

The number of cases of principal reportable diseases were: Diphtheria, 57; scarlet fever, 45; measles, 117; whooping cough, 19; typhoid fever, 2; tuberculosis, 47.

Included in the above were the folowing cases of non-residents: Diphtheria, 8; scarlet fever, 3; measles, 2; tuberculosis, 8.

Total deaths from these diseases were: Whooping cough, 1; tuberculosis, 10.

Included in the above, were the following non-residents: Tuberculosis, 2.

# Obituary.

## WILLIAM ALLEN BROOKS, M.D.

Dr. William Allen Brooks, Boston surgeon, died at the Brooks Hospital, which he had founded, on Corey Hill, Brookline, May 20, 1921, of heart disease, at the age of fifty-six.

Dr. Brooks was the son of William Allen Brooks of Haverhill, where he was born August 15, 1864. After graduating from Harvard College in 1887, he took his M.D., with an A.M., at Harvard Medical School in 1891, served as house officer at the Massachusetts General Hospital, and settled in practice in Boston. While in college, he was prominent in football and rowing. Early showing an interest in anatomy, he became assistant in anatomy at Harvard Medical School, holding the position from 1893 to 1895, when he was advanced to demonstrator, a position he filled until 1901. Two years later, he was made assistant visiting surgeon, and later, surgeon to the Massachusetts General Hospital, while serving as surgeon to St. Elizabeth's Hospital, then at 61 West Brookline street, South End. Dr. Brooks was medical examiner for the Boston Elevated Railway. During the World War, he was chief surgeon to the State Guard, with the rank of lieutenant-colonel, showing great skill and executive ability in organizing an emergency hospital in the Commonwealth Armory in Allston, that could care for a very large number of injured at short notice. He perfected a motor dressing station for use in riots and military emergencies, that he demonstrated to his fellow members of the Massachusetts State Committee, Council of National Defense, Medical Section.

In 1915 he built and incorporated the Brooks Hospital of 34 beds, at 227 Summit Avenue, Brookline. Here there are two wards devoted to the treatment of industrial accidents. Dr. Brooks was in charge, and of late years, after the death of his wife, in 1919, lived in the hospital, previously having had a residence in Lincoln, and a winter home and office at 167 Beacon street, Boston.

Dr. Brooks is to be credited with having organized and dispatched the first medical relief expedition to Halifax, Nova Scotia, after the disaster there in 1917, and with the establishment of the Corey Hill Cubicle Hospital for the outdoor treatment of influenza patients in the epidemic of 1918.

He married Miss Helen M. Winchell of New Haven, Conn., in 1892. Their only child died in infancy. A brother, George Brooks, of Haverhill, survives him.

## CHARLES FLORENCE McCARTHY, M.D.

Dr. Charles Florence McCarthy, a fellow of the Massachusetts Medical Society, died at his home in Winchester, May 19, 1921, aged 51 years.

He was a native of Stafford Springs, Conn., where he was born August 24, 1869. His education was received at Monson Academy and Middlebury College, Vermont; his medical degree was from the Long Island College Hospital, Brooklyn, N. Y., in 1890.

Dr. McCarthy was a member of the Board of Overseers of the Poor in Winchester for 18 years and assistant medical examiner for the fifth Middlesex district. He is survived by a widow (Mrs. Nora Healy McCarthy) and by a son and daughter.

## EDWARD ELIAS MATHER, M.D.

Dr Edward Elias Mather died at his home in Williamstown, May 22, 1921, at the age of 77. A descendant of Rev. Richard Mather, he was born in Williamstown in 1844, prepared for college in the Rev. Nathaniel Griffin's School, and graduated from Williams College in 1868, taking an A.M. there in 1871, the same year that Columbia University, New York, gave him an M.D.

Dr. Mather joined the Massachusetts Medical Society in 1876 and practiced medicine in his native town for forty years. His name was placed on the retired list in 1910 With the assistance of Dr. Henry L. Sabin and Dr. A. M. Smith, Dr. Mather organized the first board of health in Williamstown, always taking a strong interest in the affairs of the town. He was never married.

### RECENT DEATH.

Dr. Aurelius Sherwin, graduate of the University of Vermont, 1872, and member of the Vermont Medical Society, died at his home in Boston, on April 8, 1921, of broncho-pneumonia, at the age of 83. He was a practitioner in Boston for 40 years.

## Society Meetings.

### THE BOSTON SURGICAL SOCIETY AND THE BIGELOW MEDAL.

One of the most notable events occurring during the sessions of the American Medical Association was the meeting arranged for by the Boston Surgical Society for the purpose of presenting the Bigelow Medal to Dr. William J. Mayo. On the platform with Dr. R. W. Lovett, President of the Society, and Dr. Mayo, were Major General Sir Robert Jones, K.B.E., C.B., of Liverpool; Jacques Calvé, of Paris; Prof. V. Putti, of Bologna; W. W. Keen, George H. Monks, first president of the Society; William Sturgis Bigelow, Hugh Cumming, U. S. Public Health Service; Surgeon General Ireland; Harvey Cushing and Walter C. Howe, Secretary of the Society. In the audience were many eminent members of the profession and prominent scientific and social leaders.

The opening paper was read by Dr. Lovett, and is as follows:

ADDRESS AT MAYO MEETING ON JUNE 6, BY ROBERT LOVETT, M.D., PRESIDENT OF THE BOSTON SURGICAL SOCIETY.

The medical profession in its continual warfare against disease may not unfittingly be compared to a small, and not particularly well organized army, entrenched in a fortified camp in a country, which in part at least, is none too friendly.

This camp is subject to constant small raids and continued guerilla warfare, but at times attacks in force are made upon it by those who wish to do injury by limiting the territory which is held, by damaging the equipment and usefulness of the army, and by attempting to discredit it by making false statements charging cruelty and inhumanity. But year by year, in spite of this, perhaps partly because of this, the fortications become a little stronger, the camp extends a little, the equipment of defense is freshened up by use, and the yearly attacks are on the whole repelled, more often with some gain—a gain which mounts steadily.

This extension of the territory, this strengthening of the ramparts is due, in part, to the privates of the army, and in part to its leaders. The privates are unselfish, hard working, devoted men, given to charitable enterprises, not particularly well remunerated, and laboring unceasingly in this warfare.

The leaders of the army do not become leaders in the same way as in the army that fights with powder and shot,—they are neither appointed by a superior authority nor elected by their comrades. They nominate, qualify, and appoint themselves. Rising thus to leadership by their own attainment, and by that alone, it follows that no influence, no money, no power, no notoriety can make a man a leader in medicine, and no combination, no authority, and no clique can prevent him from becoming a leader, provided he has within himself the necessary requirements.

The leader in medicine is essentially a self-made man, standing on his own feet, strong in his own convictions, relying on his own achievement. He must win and hold his place by honesty, strength, skill and ability. But he must possess something more than mere professional skill and ability—call it what you will, character, spirituality, or vision, there must be something in the man that commands personal respect and confidence, or he cannot qualify.

These are the essentials required of the leader in medicine; he may be young or old. He may originate in a large city or in a small town, he may come from the East or the West, but once having attained real leadership he belongs to no town, state or nation, he becomes a national and international asset and his recognition comes correspondingly from all parts of the world.

The great leader, whose name has been given to the medal, which is to be presented tonight, found his origin in a large eastern city, a city with honorable medical traditions, a medical center, possessing an old and leading medical school, and during his active life he was surgeon to a hospital, famous then as now, as a center of sound medicine and surgery.

In contrast to this, the guest, in whose honor we are meeting tonight, had his origin in a small western town, at that time without a medical school or a world famous hospital. He did not go to a medical center to start his life work,—he made the medical center come to him. In Rochester, a small Minnesota city, he and his distinguished brother have built up a clinic and a medical school which is a Mecca for the surgeons of this country and Europe. They have brought within reach of the poor as well as of the rich, the highest possible grade of medical and surgical service, and they have endowed the institution so that it may outlast their time. This achievement has been built up from nothing, by vision, by professional skill of the highest degree, by the spirit of service, and by wise and broad-minded administration.

Some seventy years ago, a retired clergyman, a contemporary of Dr. Bigelow, by name Ralph Waldo Emerson, living in a small town not twenty miles from where we sit tonight, with characteristic clear-sightedness, and prophetic vision, wrote words which will introduce our guest far better than any words of mine can do. He wrote—that if a man could find a better method of helping human needs than those which existed, men would wear a footpath to his door though he lived in a pine forest.

The path to the Mayo Clinic in Rochester is worn wide and deep. I present to you—Dr. William J. Mayo.

Dr. Mayo's paper was under the title: "In the Time of Henry Jacob Bigelow."

After reference to Dr. Bigelow's lineage, tributes to this great surgeon were paid and comparisons made with the individual characteristics of eminent men of his time; Dr. Bigelow's influence on medical education, the development of the Massachusetts General Hospital, various charitable organizations, and the development of orthopedic surgery were set forth.

His studies abroad brought him under the influence of leaders in the French and English schools, the distinctive qualities of both having a great influence in developing a marked natural ability of mind and body which made him not only a great surgeon but also a student who could grasp the real import of problems coming to his attention.

References were made to analytical estimates of his work by David W. Cheever and some of his pupils. Incidentally, Dr. Mayo strongly urged the proper regulation of animal experimentation and charged the profession with failure to supervise and regulate this essential department of medical teaching and investigation, and showed that much opposition to vivisection, so-called, was due to irregular and unnecessary work done by persons who were not qualified to engage in it.

All in all, it was an impressive address, and was enthusiastically applauded. The address will appear in full in the *Journal of the A. M. A.*

### INTRODUCTION OF DR. GEORGE H. MONKS, FOLLOWING DR. MAYO'S ADDRESS.

The Boston Surgical Society has been entrusted by a donor, who desires to remain anonymous, with a sum of money, the income of which is to be devoted to the presentation of a gold medal at such intervals, and to such persons as seems to the society best. It is specified that the medal "is to be awarded for conspicuous contributions to the advancement of surgery."

Up to this time, largely on account of war conditions, no medal has been given. The Society has unanimously decided to make the first award of the Henry J. Bigelow Medal to Dr. William J Mayo of Rochester. Dr. George H. Monks, the first president of the Society, and a former assistant of Dr. Bigelow, will now present the medal.

### DR. MONKS.

Dr. William J. Mayo: earnest student and untiring practitioner of surgery, who has contributed largely to its advancement; keen observer, who has been quick to appreciate the true value of new ideas and new methods, wherever they may have originated; honest and fearless critic; prolific writer; teacher of surgeons from all parts of the world; princely contributor to the cause of medical education and research; one who has made mankind his debtor; in the name of the Boston Surgical Society, and by its direction, I have the honor and pleasure of presenting to you the Henry Jacob Bigelow medal.

Dr. Mayo bowed in acknowledgment of the honor conferred.

Dr. Lovett then announced that the meeting was adjourned.

* * *

## THE A. M. A. OPENING MEETING.

The general exercises of the A. M. A. meeting was opened in the Opera House, Tuesday evening, June 7, at 8.30. After announcements by the Committee of Arrangements, Governor Cox extended the welcome of the State to the Association and spoke at length on the importance of medicine in dealing with the vital problems of humanity.

Mayor Peters cordially welcomed the visitors to the city of Boston and spoke of the important contributions of physicians to the welfare of this municipality. He spoke specially of the work now under way for the purpose of preventing the threatened invasions of bubonic plague and urged the delegates to visit the city institutions.

President Hubert Work then delivered his address. Beginning by reference to the founding of the nation by the Pilgrims, characterizing the rock as the "cradle of the nation's soul," and with the spirit of home-coming children, said, "We return not in sorrow or with apology, but we come with pride to the home of Dr. Turner, the first licensed American physician, bringing with us men whose fame is international, whose teachings have been translated into many tongues, whose names will endure with the language of medicine."

He then characterized the American Medical Association, representing 80,000 trained medical men, as the Plymouth Rock of American medicine, and proclaimed that the governing purpose of the Association is to collect and disseminate truths in medicine, perfect science, expose pretence, elevate medical men, and to bind medicine to the government, its armies and its municipalities, with the hope that the Church will join with it for the greatest good for the greatest number. He outlined the duties of the physician, now that the war is over, and said that no armistice was signed with disease, and that medicine must include the larger field of civic service. "No one believes that the physician should husband his special knowledge and sell it to individuals only; medicine is recognized as public service and we must contribute our quota to public welfare, because we are citizens set apart as servants of health." He brought out the distinction between physicians and pretenders. "The attitude of the quack is not to prevent disease but to invent it," and that the interests of physicians in medical licensure is to prevent the appropriation of the title, Doctor of Medicine, for the purpose of deception.

In his admonition to young men, he said that he must not enter the domain of medicine with the commercial instinct, and when we consider that we are as one in eight hundred of the people, we must not regard ourselves as dictators but under the conception of the broadest opportunities we must study the problems involved in every human interest.

In referring to medical education, he said that the first and last hope of scientific medicine lies in the medical colleges and local medical societies, and there should be opportunities for post-graduate studies for the practitioner in rural communities. To provide for small localities there should be health centres and, when necessary, the state should supply hospital laboratories and other aids.

Proceeding to discuss the standardization of medical colleges and hospitals, he said that the grading of medical colleges was a sinecure compared to the grading of hospitals, and elaborated the problems involved.

The benefits and dangers of group practice were discussed, and he said that "the future of group practice will be determined by its attitude to other groups and independent practitioners. If its governing purpose is altruistic it will endure, if its first purpose is commercial it will deservedly fail."

Reference was made to a local cult which treats all illness as imaginary in the following words:

"It soothes the sick by denials, while nature effects a cure or the sufferer passes out, much as a mother assures her frightened child at night that its terrors are dreams and without substance, until realities readjust its disordered fancies.

"Although this theory of 'three Graces' is not applied to food or clothing or housing, admits birth but denies death, denies disease and ignores its causes, it has been a lasting comfort to those who are well and finds prepared soil in distress, for 'in the shadow of a great affliction, the soul is dumb.'

"The Christian religion has been taught 2,000 years without recognizing in practice the basic principle of its founder, read in the challenge, 'Show me your faith without your works, and I will show you my faith by my works.' The human touch of a spiritual man was the professional equipment of a physician the world has worshiped for twenty centuries. Yet His spiritual teachings have been passed to ministers of His gospel, and His miracles of healing have been emulated by doctors of medicine."

The impossibility, under present conditions, of efficiently dealing with the criminal, the prostitute and the insane was emphasized, but of all agencies medicine could do most in constructive effort. His closing statement follows:

"American medicine has its greatest achievements before it. It must go to the crossroads and villages for its vision of service, call in its troopers, and train from the outskirts, toward common centers.

"It must prevent disease where possible, relieve it where it occurs, aid in the upkeep of earning power, and contribute its influence to maintaining the integrity of a nation's physical and moral fabric.

"I would plead for that spirit of service which governed practitioners of the last century, who, knowing less of medicine, depended more on personal attention than we now do; for the spirit of William McClure, of fiction, confined for a life time to the highland limits of a day's ride; of our own General Gorgas, who converted a slough of death into a resort for health, and turned the traffic of a world; for that which prompted the self-sacrifice of Walter Reed, who invited death that others might safely pass; the spirit of thousands of men who have preceded us, whose names were unknown or have long been forgotten, but of each of whom the recording angel wrote, 'He went about doing good.'

"Neither hope of professional advantage nor desire for personal aggrandisement, through the highest office my profession has to give, moves me. But if service to it may strengthen the bond of human sympathy between our people, and the altruism and science of medicine, I shall be content. For, 'Of all the work my hand hath wrought beneath the sky, save a place in kindly human thought, no gain have I.' "

## Miscellany.

## RÉSUMÉ OF COMMUNICABLE DISEASES. APRIL, 1921.

*General Prevalence*: 9,735 cases of communicable diseses were reported for April, as compared with 10,519 for March. However, there were reported less cases in both January and February. The excess for April over January and February is due almost entirely to the regular increase in measles that has been occurring each month since the beginning of the present epidemic of that disease last November.

There were decreases in the reported incidence of all the more important communicable diseases, except measles, which numbered 3,293 cases, compared with 2,836 for March.

*Diphtheria*, which in January was more prevalent than for any month of 1920, has steadily decreased each month since then. In January, there had been 965 cases. The total for April was 676.

*German Measles* exceeded 100 cases both in April and in March. This has not happened since July, 1918. There were 101 cases reported in April and 107 in March.

*Gonorrhea* and *Syphilis* were reported in about the usual numbers; 468 for the former and 216 for the latter. Roughly speaking, there are now being reported monthly, about 500 cases of gonorrhea and 250 of syphilis.

*Measles*, as has been said, reached the highest number yet reported during the present epidemic.

*Lobar Pneumonia*. There were 565 cases of lobar pneumonia reported. Our death returns on this disease show that probably not more than one-third or one-fourth of all cases were reported.

*Scarlet Fever*, which, with 1,258 cases in March, had been gradually increasing since last August, began to decrease again and but 1,016 cases were reported.

*Whooping Cough* still remains high, though there was a decrease from 894 for March to 707 cases for April.

*Typhoid Fever*. The number of reported cases of typhoid fever to May 1, 1921, has exceeded that reported for the first four months of last year by 16 cases. There were 44 in April.

### RARE DISEASES.

*Anthrax* was reported, from Danvers, 1.

*Anterior Poliomyelitis* was reported, from Lawrence, 1; Sutton, 1; Worcester, 1; total, 3.

*Dog-bite requiring anti-rabic treatment* was reported, from Fall River, 5; Lowell, 3; New Bedford, 1; Winthrop, 2; total, 11.

*Dysentery* was reported, from Cambridge, 1.

*Encephalitis lethargica* was reported, from Boston, 4; Brookline, 1; Dudley, 1; Easthampton, 1; Fitchburg, 1; Lynn, 1; Mendon, 1; Norwood, 1; Wakefield, 1; Weymouth, 1; Worcester, 1; total, 14.

*Epidemic cerebrospinal meningitis* was reported, from Blackstone, 1; Boston, 5; East Bridgewater, 1; Fall River, 1; Haverhill, 1; Holliston, 1; Milford, 1; New Bedford, 2;

Salem, 1; Springfield, 1; Tewksbury, 1; West Bridgewater, 1; Worcester, 1; total, 18.

*Leprosy* was reported, from Boston, 1.

*Malaria* was reported, from Boston, 3; Fall River, 2; total, 5.

*Pellagra* was reported, from Brockton, 1; Danvers, 1; Waltham, 1; total, 3.

*Septic sore throat* was reported, from Boston, 4; Bridgewater, 1; Brockton, 1; Fitchburg, 1; Malden, 1; Mansfield, 1; Newburyport, 1; Worcester, 1; total, 11.

*Smallpox* was reported, from Boston 4; Malden, 3; total, 7.

*Tetanus* was reported, from Boston, 1; Dennis, 1; Clinton, 1; Lynn, 1; Salem, 1; total, 5.

*Trachoma* was reported, from Boston, 7; Braintree, 1; Brockton, 1; Lawrence, 1; Plymouth, 1; Somerville, 1; Watertown, 1; Worcester, 2; total, 15.

*Trichinosis* was reported, from Boston, 1; Winchester, 1; total, 2.

## HEALTH NUGGETS.

Germs, says the U. S. Public Health Service, are usually a hand to mouth affair. Better wash up.

Holes in the street are warnings against more holes. So are holes in the graveyard. Repairs in time will delay both.

Some people say that sanitation doesn't pay. Well, it doesn't pay doctors and grave-diggers, says the U. S. Public Health Service. Be sanitary; seek health before you need it.

Venereal diseases are diseases, not crimes, says the U. S. Public Health Service. Many people have been infected innocently or in very early youth. The incidence of the disease in boys of 17 is very high.

If treated promptly by reliable doctors or at public clinics, venereal diseases can be cured, say the U. S. Public Health Service. Patent medicines bought without competent advice, often do great harm. The same is true of the work of most doctors who advertise that they cure "men's" diseases

Many lives and much property are lost every year because of accidents due to venereal diseases, says the U. S. Public Health Service. So great, in fact, are these losses that the National Safety Council has issued a bulletin on them. For instance, four serious recent railway wrecks were traced to employees who failed because they were suffering from paresis, which is a form of syphilis.

In order to save workingmen from ill health resulting from insanitary working conditions and to save manufacturers from incurring claims from damages, it is necessary for the Public Health Service to examine physically both the workmen and the plant in which they work. Some manufacturers and many workmen fear examination, believing that it will be used to make trouble for them, and not realizing that undiscovered defects in either plant or man will surely lead to serious results. To such the Public Health Service says that it is strictly neutral and that it will not "tell tales." Its object is to improve the health of the men and to enable the factory to save money by making its employees healthy by giving them healthy working conditions.

Don't give the baby patent medicine. If you feel you must use advertised remedies, try them on yourself, or better still, on the dog. Let your family doctor attend to the baby.

The U. S. Public Health Service estimates that at least 500 and possibly 1000 lepers are at large in the United States, and that the number is increasing. The government did not start work on its Federal Home for Lepers a minute too soon.

It took Ehrlich 606 experiments to discover a way to give a man arsenic enough to kill syphilis germs in his blood without running the risk of killing him. He called the result 6—0—6, or "salvarsan." In this country the United States Government supervises its production through the Hygienic Laboratory of the Public Health Service and calls it arsphenamine.

The scratch of a lion's claw is almost as deadly as his bite, for he never cleans his nails, and he always carrys under them rotting meat that is rank with deadly germs. Flies and water bugs do the same thing on a smaller scale; and, "Don't forget," says the U. S. Public Health Service, "that they never wipe their feet."

The U. S. Public Health Service calls attention to the fact that only twenty-three states have efficient birth registration laws; eighteen have imperfect ones; and five have none at all. Inability to prove age may cause all sorts of legal troubles later in life—in proving citizenship, in voting, and in inheriting, for instance. Don't forget to make sure that the new arrival in your home has been registered.

And now we have the woman dental hygienist. She does not pull nor fill teeth, and consequently is not a terror to children. Instead, she limits her work to cleaning and polishing the teeth above the gums. The U. S. Public Health Service says that this is most helpful in making the gums healthy and in preventing decay. Twelve states have already legalized such practice by women.

"On March 5, the date of our last weekly report," says the Surgeon General of the U. S. Public Health Service, "about 2050 beds were vacant in our hospitals. Of these, about 1000 were in hospitals just opened or additions to older hospitals and were rapidly being filled. The remaining 1000 was less than 6% of our total capacity of 17,648, a very small allowance for new arrivals. This does not, of course, include our patients in rented beds in contract hospitals, who numbered 10,506.

Bedbugs are easily gotten rid of, says a recent publication of the U. S. Public Health Service, by exposing them to extremes of temperature. Cold as low as 17° F. above zero, or as high as 100° F. above, if continued for two or three days, will destroy them. The cold might be applied in the north, for instance in country houses whose owners leave them unoccupied during the winter, or in houses that can be evacuated for a few days. The Service offers no suggestion as to the heat end of the problem, but a roaring furnace for two or three August days might serve—if the owners could camp out for the interval.

## MEDICAL AFFAIRS IN MEXICO.

Editor of the Boston Medical and Surgical Journal,
*Dear Doctor:—*

Your request that I write an article for your Journal "giving concise information about medical affairs in this country," is quite a large order; it includes hygiene, sanitation, epidemic and endemic diseases, quarantine laws and local and general laws governing, or not governing, the foregoing subjects, and the laws governing the practice of medicine in this city.

Owing to the ten years of revolution, this country is plentifully supplied with bubonic plague, typhus, yellow fever and smalpox. The last three are, practically, endemic in costal towns and cities, while smallpox is considered endemic in most of the cities in the republic, at present.

Each state is supposed to have a board of health which may regulate the practice of medicine in its environs, but I am informed that only a very few of them require an examination in Spanish as a requisite to practice medicine.

The federal district of which the City of Mexico is the capital, makes its own laws, and the Board of Health here, during the Carranza régime, passed a law conceding to any practitioner, who had lived three years in this country, the right to have his diploma validated, if the college from which he was graduated was recognized as exacting the same requisites as those of the National School of Medicine in this city.

Many of the foreign doctors here took advantage of this decree and obtained the right to practice medicine in this city under that decree.

The constitution of this republic, however, grants to all persons to engage in any occupation so long as it does not conflict with, or endanger, the lives or property of the people, hence, at present, any professional man can practice his art in this city with perfect freedom, although he obtains no legal standing and cannot collect his bills by law.

This condition, however, is likely to be readjusted by the next regular session of the national congress in this city, as a bill has been introduced, constitutionally providing that every professional man who has no diploma from the national or state colleges must take an examination in the Spanish language, unless he has a diploma from some country which has a reciprocity treaty with Mexico, as have Spain and Japan.

This examination is conducted by a jury of five professors, and covers, practically, every important branch of the profession; it is both oral and practical, and is conducted in a very fair and just manner.

I believe that I was the first American physician to take this examination, more than twenty years ago.

It is the general belief here, among the Mexican physicians, that the bill mentioned will be passed, as it is only what is required by civilized countries in general, and Mexico is endeavoring to get into line with other progressive nations.

With my best regards, believe me,

Very truly yours,
A. W. Parsons, M.D., Harv. '80.

## AN APPRECIATION.

Mr. Editor:

Inasmuch as the American Medical Association was invited by the Massachusetts Medical Society to hold its seventy-second annual session in Boston, it will interest the Fellows to know that the Secretary of the National Association said to the Secretary of the State Society as he was returning to Chicago, June 10, at the close of the Convention, that the American Medical Association very much appreciated the kindness shown to them and the support afforded by the Massachusetts Medical Society all along the line; that the session had been a banner meeting, and the assistance given by the local members had been unequalled at any previous meeting.

Respectfully yours,
Walter L. Burrage.
*Secretary.*

## A WARNING.

A preparation labelled "Arsphenamin," of supposedly German origin, is being sold in this country. Analysis shows that this compound is fraudulent and does not contain the required ingredients. Care should be exercised in buying arsphenamin unless it is known to be put out by a reputable firm.

## APPOINTMENT.

Dr. Howard H. Streeter, formerly of the Massachusetts Department of Public Health, has been appointed Executive Officer of the Board of Heath of Manchester, N. H., and assumed duties June 15, 1921.

## RECENT DEATH.

Dr. Arthur Bennett Morong died in Boston, May 3, 1921, at the age of 71. He was born in Cambridge October 25, 1849, took an A.B. at Amherst College in 1871, and an M.D. at Harvard Medical School in 1876. After teaching zoölogy in the Boston High School for two years, he joined the Massachusetts Medical Society and settled in practice in Boston, remaining until his death. For many years he was professor of clinical medicine and physiology in the College of Physicians and Surgeons, Boston, having first served that institution as professor of physiology and hygiene.

The Boston Medical and Surgical Journal

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## Original Articles.

### CONGENITAL MALFORMATIONS OF THE VERTEBRAE.

By Nathaniel Mills, M.D., New York,

*Attending Surgeon, Department of Scoliosis, New York Orthopedic Dispensary and Hospital; Instructor in Orthopedic Surgery at College of Physicians and Surgeons, Columbia University.*

A study of the abnormalities of the vertebrae as revealed in x-rays, shows that they are of quite common occurrence and frequently the cause of scoliotic deformity. These facts are exemplified by the frequency of such abnormalities in the plates of one hundred consecutive cases of scoliosis from the x-ray files of the New York Orthopedic Dispensary and Hospital.

These abnormalities may be conveniently placed in three classifications: Defects in development, changes in type, and changes in relation.

#### DEFECTS IN DEVELOPMENT.

The vertebrae grow from three primary and at least five accessory centres of ossification; the median one of the primary centres forms the greater part of the body, while the other two, one appearing in each pedicle, form the postero-lateral part of the body, the arch, and the greater part of the processes. The accessory centres appear at the tips of the spines and transverse processes and at the upper and lower surfaces of the bodies to complete their growth, but apparently are not a factor in the production of the abnormalities observed. Abnormalities in the growth at the primary centres, however, may cause defects in development of the vertebrae. An extra lateral centre would cause a hemi-vertebra (Plate I and II). The absence of a lateral centre or centres would cause a lateral wedging of the vertebra (Plate III), whereas the absence or defective growth of the centre for the body would cause an absence or atrophy of the body of the vertebra.

Spina Bifida is a marked posterior defect of the vertebrae, caused by defective development of one or both lateral centres. Slight posterior defects are commonly called hidden Spina Bifida. Posterior defects occur most frequently at the lumbar sacral junction and somewhat less frequently at the dorso-lumbar junction, and here are usually simple (Plate VI and VII), but when they appear elsewhere are directly combined with some other abnormality (Plate II).

The centres of growth of adjacent vertebrae may fuse together, causing a fusion of the bodies alone (Plate IX), if the median primary centres are affected. The laminae transverse process and spines may be fused with the bodies unaffected (Plate X) if the lateral primary centres are involved. Finally if the costal elements are affected there is fusion of the adjacent ribs or bifurcated ribs (Plate X).

Defective development of a lateral articular process of a vertebra is also seen. This may occur as a rudimentary development of the process or a change in the plane of the articulation. Rudimentary development of an inferior articular process of the fifth lumbar vertebra is most commonly seen (Plate VIII) with a somewhat less frequent involvement of the fourth lumbar. The inferior lateral articulation of the fifth lumbar vertebra quite frequently may be in the antero-posterior plane (Plate XII and XIII), and much less frequently the fourth lumbar, while the articulations of the other lumbar vertebrae are of the internal-external plane of a normal lumbar vertebra.

### CHANGE IN TYPE.

The change in type is determined by the growth of the costal element. In the change from the cervical to the dorsal type the costal element of the seventh cervical vertebra may fail to fuse and we have a cervical rib (Plate X). A change from the dorsal to the lumbar type is indicated by decreased number of ribs when complete (Plate XV) or by the rudimentary (Plate II and XI) twelfth ribs when the change is not complete. An increase in the number of ribs indicates a change from the lumbar to the dorsal type (Plate I and III).

The transverse processes of the fifth lumbar vertebra may be enlarged by increased development of the costal element, which would indicate a change from lumbar to sacral type. These enlarged processes may have contact with the sacrum, when they may be designated as sacralized (Plate XIV) or they may also have contact with the ilium, as is the case in a normal first sacral vertebra, and the vertebra is then said to be of the sacral type. But it may be classed as a lumbar vertebra if there is a true movable joint between it and the sacrum.

We may also have six lumbar vertebrae with a normal or increased number of ribs, indicating a change from a sacral to lumbar type. The sixth lumbar vertebra may be of normal type (Plate XVI, left), have enlarged transverse processes, be sacralized (Plate XV), or have contact with the ilium and be of the sacral type (Plate XVI, right).

### CHANGE IN RELATION.

A change in relation either tilting or rotation between two adjacent vertebrae, more marked than would be produced by their normal movements in the scoliotic deformity, may occur (Plate XIII and XVII). This tilting or rotation may be secondary to some other abnormality, such as antero-posterior (or A.-P.) articulation (Plate XIII), rudimentary inferior articular process (Plate VIII) or enlarged transverse process (Plate XIV), but frequently no cause for the abnormal tilting or rotation is demonstrable.

In this series there were thirty-eight instances of defects in development, sixty-five instances of change in type and thirty-nine instances of change in relation, as follows:

*I. Defects in development=38*

- 1. Posterior defects=8
    - of 1st Sacral=3
        - 2 simple
            - 5L tilted=1
            - Enlarged transverse process=1
        - 1 combined with posterior defects elsewhere
    - of 5th Lumbar=1 Enlarged transverse process 5L of the sacral type and 5L tilted, 13 ribs
    - of Dorso-lumbar Junction=3
        - 2 simple (Plate VI
        - 1 combined with hemivertebrae of 13D
    - of Dorsal=2
        - 1 (13-14D) combined with posterior defect 1S and wedging 10-13D (Plate III)
        - 1 (2D) combined with hemivertebra 3D (Plate II)
- 2. Body=5
    - (a) Wedged=2
        - 9 and 10D and 4 and5L
        - 10-13D has 14 ribs (Plate III)
    - (b) Absence=1—5L
    - (c) Hemivertebrae=2
        - 3D (Posterior defect 2D) (Plate II)
        - 13D (Posterior defect 12D)
- 3. Fusion
    - (a) Bodies=0
    - (b) Transverse processes, laminae and spines=0
    - (c) Bifurcated ribs=0
- 4. Lateral articular process=25
    - (a) Rudimentary=17 (Plate VIII)
        - of 4th Lumbar=4 unilateral
        - of 5th Lumbar=13 unilateral
    - (b) Change to antero-posterior plane (5L)=8
        - Unilateral=6
            - 4 with
            - 2 against
            - (Plates XII and XIII)
        - Bilateral=2

*II. Changes in type=65*
1. Cervical to dorsal=3 (Plate XI)
Cervical ribs=3 (combined)
2. Dorsal to lumbar=35
Complete=3
11 ribs=3 (2 with five lumbar vertebrae)
10, 12 ribs=1 (Plate IX)
11, 12th ribs (rudimentary 12th)=1
Rudimentary 12th ribs (3 unilateral)=30 (Plates II and XI)
3. Lumbar to dorsal=3
14 ribs (rudimentary 14th)=1 (Plate III)
13 ribs (rudimentary)=1 (Plate I)
12, 13 ribs (13th rudimentary)=1 (Plate V)
4. Lumbar to sacral=9
Five lumbar vertebrae with 11 ribs=2
Enlarged transverse processes 5th lumbar=6 (Plate XIV)
Unilateral=2—sacralized=2
Bilateral=4—sacralized=4 { 1 sacral type
13 ribs
Enlarged transverse processes 6th lumbar with 11 ribs=1
5. Sacral to lumbar=15
6 lumbar vertebrae=15 (Plates XV, and XVI and XVII)
(a) Enlarged processes=11
(b) Sacralized=10 { Sacral type=5
Unilateral=1
Unilateral=1

*III. Changes in relation*
1. Rotation=14 (Plate XVII)
Simple=7
4th Lumbar=4 { Combined with enlarged transverse process=5 (out of 18)
5th Lumbar=7 Same vertebra=1
6th Lumbar=2 Combined with antero-posterior articulation=2 (out of 8)
11th Dorsal=1 Same vertebra=2
Combined with posterior defects and wedging elsewhere=1
2. Tilting=26 (Plates VIII and XII and XIV and XVII)
With antero-posterior articulation=5 (out of 8)
4th Lumbar= 3 { With rudimentary lateral articulations= 12 (out of 17)
5th Lumbar=20 With enlarged transverse process=10 (out of 18)
4th and 5th Lumbar= 1 Same vertebra= 3
6th Lumbar= 2 With rotation=4 (out of 14)
Same vertebra= 1

*IV. Totals*
Without primary malformation=34
With primary malformation=66
Apparent cause for scoliosis=45
Apparently unrelated to scoliosis=21
Infantile paralysis=21—Malformations=7 (Cause=2)
Arthritis=1
Empyema=1—Malformations=1
Rickets=1—Malformations=1 (Cause=1)

Region involved by malformations.*
Cervico-dorsal=3
(Cervical ribs)
Cause=2
Unrelated=1
Dorsal=3
(Wedging and posterior defects)
Cause=3
Dorso-lumbar junction=36
Cause=1 (Hemivertebra)
Unrelated=35
Lumbar=0
Lumbar-sacral junction=48
Rudimentary articular process=17 (Cause)
Anterior-posterior articulation=8
Cause=5
Unrelated=3
Enlarged transverse process (5L)=6
Cause=4
Unrelated=2
Enlarged transverse process (6L) with 11 ribs=1 (Cause)
Cause=40 { 6 Lumbar vertebrae=15
Unrelated=8 Cause=5
Unrelated=10
5 Lumbar vertebrae with 11 ribs=2 (unrelated)
Posterior defects=4
Tilted=26 (simple=1)
Cause=2
Rotated=14
Simple=6
Cause=6

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* In some cases malformations occur in more than one region.

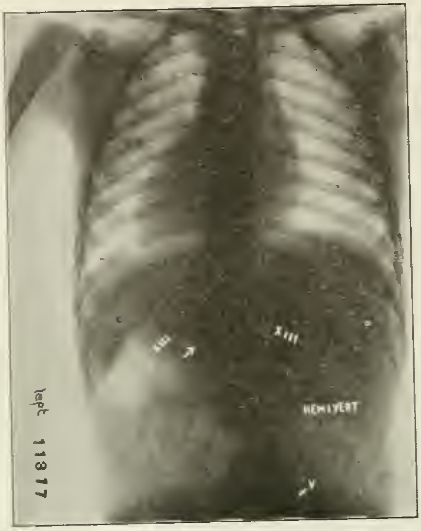

Fig. I.

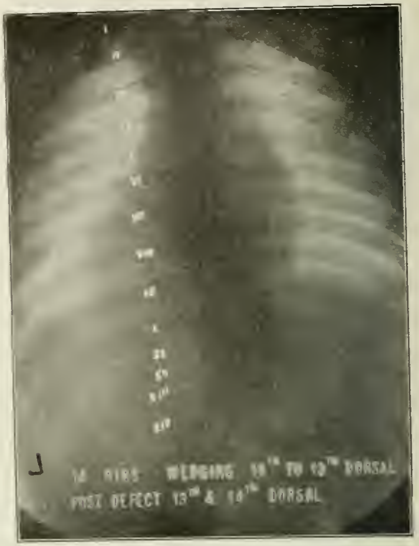
VI
VII
VIII
IX
X
XI
XII
XIII
XIV
14 RIBS WEDGING 10TH TO 12TH DORSAL
POST DEFECT 13TH & 14TH DORSAL

Fig. III.

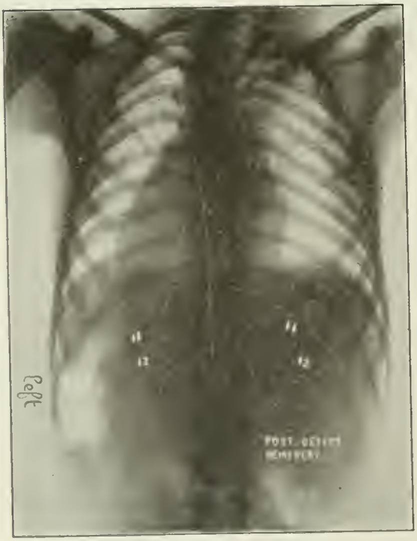

Fig. II.

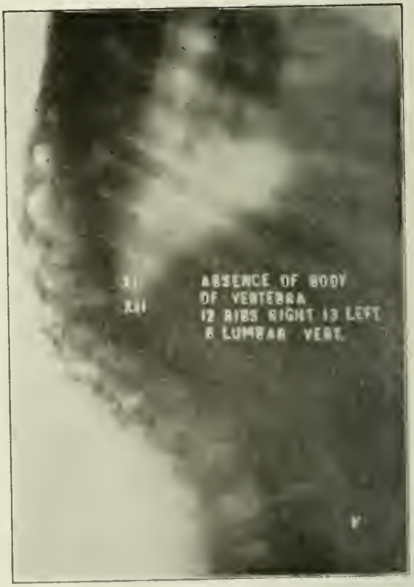

Fig. IV.

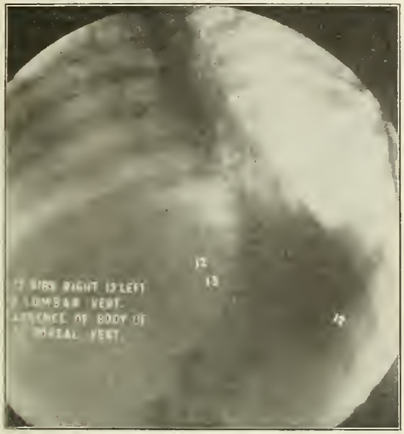

Fig. V.

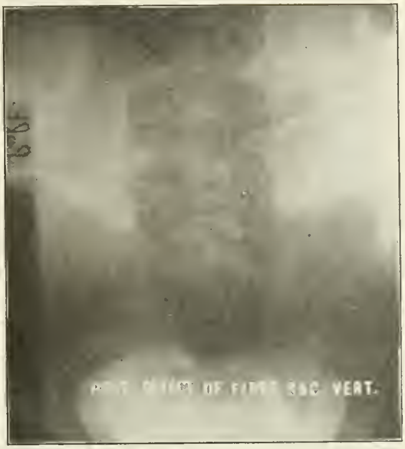

Fig. VII.

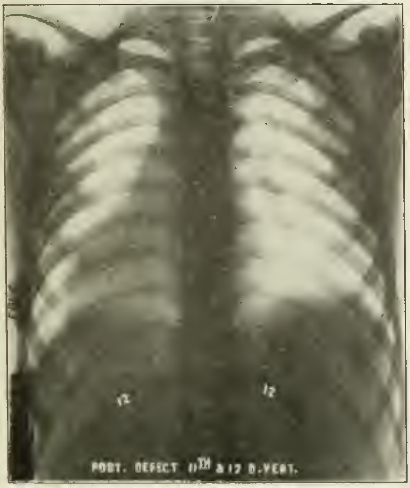

Fig. VI.

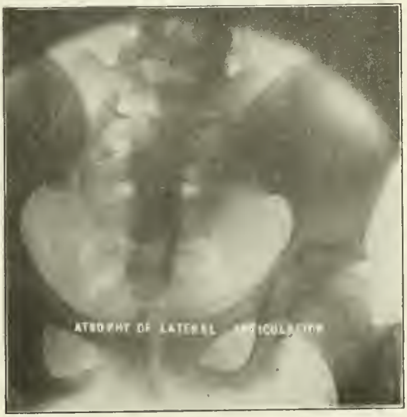

Fig. VIII.

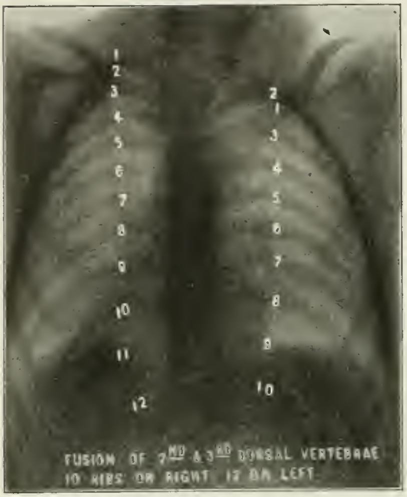
1
2
3
4
5
6
7
8
9
10
11
12
2
1
3
4
5
6
7
8
9
10
FUSION OF 2ND & 3RD DORSAL VERTEBRAE
10 RIBS ON RIGHT 12 ON LEFT

Fig. IX.

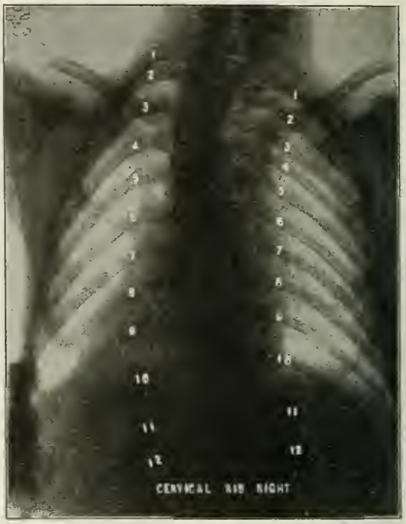

Fig. XI.

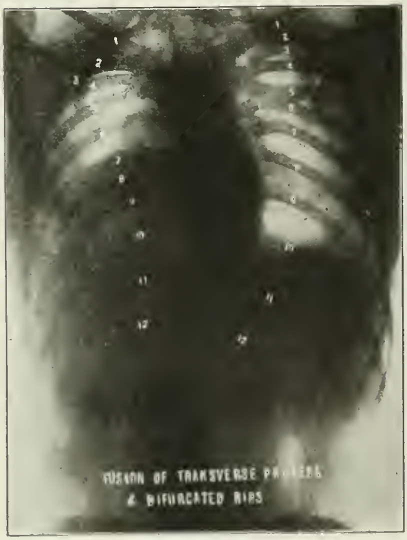

Fig. X.

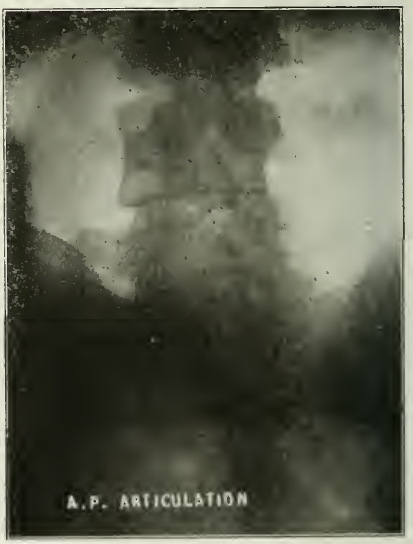

Fig. XII.

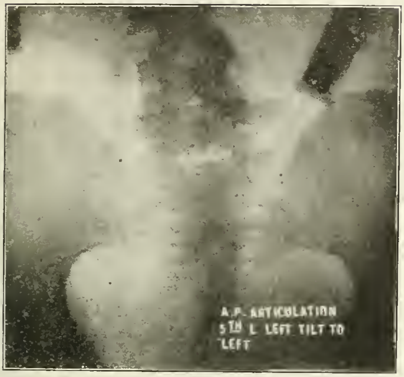

Fig. XIII.

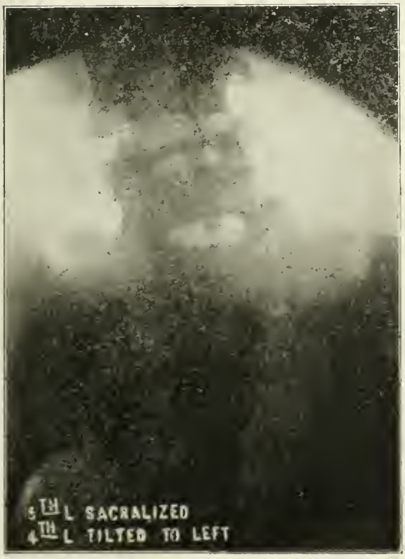

Fig. XIV.

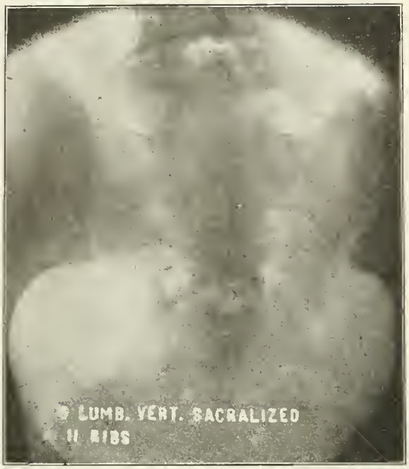

Fig. XV.

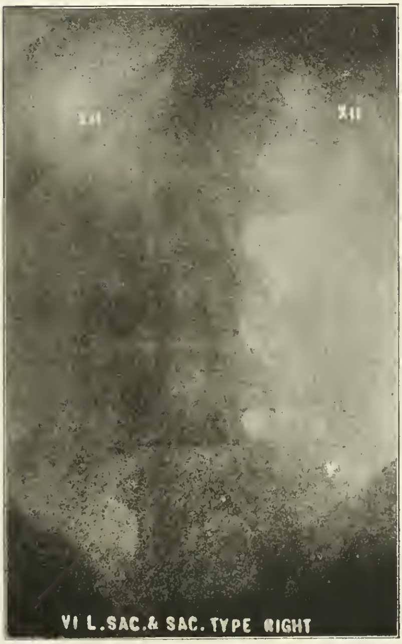

Fig. XVI.

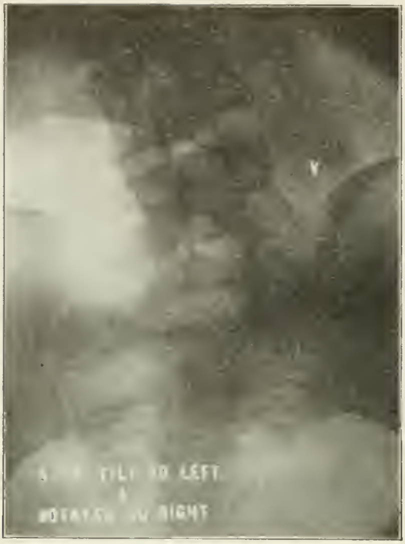

Fig. XVII.

### CAUSAL RELATION.

Defects in development, such as hemivertebrae (Plate I and II) and wedging (Plate III) are the cause of an asymmetry of the spine. This asymmetry is characteristic, in most cases, because of the irregularity of the deformity, which is quite evident on examination of the patient. The deformity, as a rule, is apparent at birth, and increases in proportion to the growth at the asymmetrical centres of ossification. Posterior defects may occur without causing any lateral deformity, as the defect is usually symmetrical (Plate VI).

A rudimentary, inferior lateral articular process is the primary cause of a curve in not a few instances (Plate VIII). The lack of development in an articular process produces a tilt, or rotation, between the adjacent vertebrae; the spine is thrown out of equilibrium and a curve results.

When both inferior lateral articulations of the last lumbar vertebra are in the antero-posterior plane, the relations of the vertebrae may not be disturbed, and no curve is produced. But when one lateral articulation is in the antero-posterior plane and the other in the internal-external plane of a normal lumbar vertebra, the vertebra is almost invariably tilted or rotated and a curve results (Plate XIII). The tilting may be either toward the side of the antero-posterior articulation or toward the opposite side. An increase in lumbar lordosis tends to separate the articular surface at the antero-posterior articulation, and a slipping occurs. This slipping may be downward when the vertebra will be tilted toward the same side, or it may be outward, when the vertebra is tilted toward the opposite side, and its internal-external articulation where there is a downward slipping because of the separation of the articular surfaces following the slipping outward at the antero-posterior articulation.

If the change in type of a vertebra is asymmetrical, a curve may be produced. For instance, if both transverse processes of the last lumbar vertebra are symmetrical a change in relation frequently occurs and a curve results (Plate XIV, XV and XVI).

Forty per cent. of the cases in this series had some abnormality at the lumbar-sacral junction as the apparent cause of their deformity. Therefore it is advisable to make a careful x-ray study of all cases of scoliosis, as these cases need treatment directed at the primary asymmetry which occurs in the lumbar-sacral junction.

The attempt may be made to correct this asymmetry by exercises. If jackets are used, their object must not be primarily to correct the curve, but to correct the asymmetry which is the cause of that curve. While if an operative procedure is used to stiffen the spine, the result will not be completely satisfactory unless a normal relation is first restored at the lumbar-sacral junction and this relation fixed by fusion.

### Bibliography.

Piersol, G. A.: Human Anatomy, 1918.

Bradford and Lovett: Orthopedic Surgery, 1915.

Lovett, Robert S, M.D., Lateral Curvature of the Spine and Round Shoulders, 1916.

Huntington, George S.: Modern Problems in Evolution, etc. The Anatomical Record, Vol. xiv, No. 6, June, 1918.

Bardeen, C. R.: Embryology of Human Spine. Keibel-Mall. Amer. Ed., 1910, p. 355 *et seq.*

Adams, Z. O.: Am. Jour. Orth. Surg., July, 1914; Boston Medical and Surgical Journal, Nov. 22, 1908, also April 28, 1910, p. 569; Jour. A. M. A., 1915, lxiv, 26-29.

Böhm, Max: Boston Medical and Surgical Journal, Jan. 25, 1905, also Nov. 22, 1906.

Bardeen, C. R.: Studies of the Development of the Human Skeleton. Amer. Jour. Anat., Vol. iv, 1905, pp. 265-302. 34-44.

Goldthwait: Boston Medical and Surgical Journal, Vol. clxiv, No. 2, 1911.

Hodgson, F. G.: Amer. Jour. Orth. Surg., 1916, Vol. xiv, pp. 34-44.

# PRINCIPLES OF POSTURE, WITH SPECIAL REFERENCE TO THE MECHANICS OF THE HIP-JOINT.

By Mabel Elsworth Todd, Boston.

## Second Paper

In the previous paper* the mechanics of the body were discussed from the standpoint of the distribution of the weight of the bones of the body in relation to the median line of the structure. It was demonstrated that when the median line of the structure passed through the center of each of the units of weight, the structure would be maintained with the least possible strain between its various parts; and the muscles, therefore, would have the greatest freedom for movement. This law is universally applied in the world of mechanics, where the weight of the articulated parts of a mechanism is so adjusted as to facilitate freedom of movement with the minimum of wear and tear. When the human structure is governed by this law of balance, there will be an equality of pressure between all articulating bony contacts and weight will be maintained at center with the least expenditure of muscular and nervous energy.

The points to be discussed in this paper are:

I. The Balance of the Principle Units of Weight in Relation to the Whole;

II. The Interdependence of the Various Units; and

III. The Significance of Normal Mechanics of the Hip-Joint, at Rest and in Motion.

### THE BALANCE OF STRUCTURAL WEIGHT IN RELATION TO THE MEDIAN LINE.

In considering this point, we note that every articulated structure must have a median line. That line may be either the mean line of the weight of the articulated groups, or the mean line of resistance between the articulated units of weight, in which each unit is being held away from center, or out of alignment. The following drawing illustrates this point: Figure I, line *a*, indicates the median line of weight of articulated groups, or equilibrium of the mass. Figure II, line *a*, indicates the degree of resistance between the units of weight, *b*, *c*, *d*.

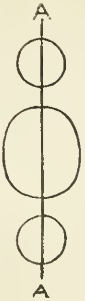

Fig. I.

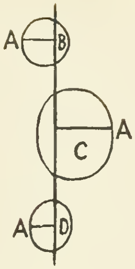

Fig. II.

It matters not whether the motive power of the mechanism comes from within or without, the above law is operative under all conditions. The motive power may be steam, electricity, or nerve energy, the operation of this law must be considered in each case, if conservation of power is to be attained. In studying the mechanics of the human structure, the problem is to find the similarities of the functioning of the anatomical parts in relation to this mechanical principle.

With the principal units of weight of a structure in perfect alignment, there would be entire freedom of action in all the flexible parts. The main function of the bony structure is to support the weight of the body. The bones, being the most inert substance of the human structure, should be maintained in such equilibrium as will require the least possible muscular effort for maintenance of weight, and thus release all muscles for perfect coördinate action in movement.

In the first paper, it will be remembered that the structure was divided into three principal units of weight, or bony "blocks," the pelvis, the thorax, and the skull. If the median line passes through the center of weight of all the units, there would be equal pressure at all points of the wall of each unit, and these three units of weight would hang at the point of least resistance, or in equilibrium. Therefore, all parts of the structure contacting with these balanced units of weight would be free from uneven pulls or strains. The conclusion reached was that if the three bony "blocks" and the shoulder girdle were not in equilibrium in relation to the central line of the structure, they must be maintained out of position by an increase of muscular effort.

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* Boston Medical and Surgical Journal, Vol. clxxxii, No. 26, June 24, 1920.

### THE INTERDEPENDENCE OF PARTS.

Continuing the above argument, a fixed position of any part of the three bony units would tend to hold that part of the spine with which it is in contact, in a stiff position. A state of fixation in any one part of the spine naturally induces the necessity for greater motion in some other portion of the spine, and we thus have an unequal strain upon the spinal column. For example, when you ask anyone to stand erect, he usually does certain definite things; raises his sternum and stiffens his ribs, thus maintaining the thoracic structure out of alignment at the expense of undue muscular effort.

The struggle in the chest wall, induced by the above mentioned conditions, imposes an inequality of pull upon the spine, which interferes with normal functioning and is a waste of energy. For instance, if the sternum were elevated beyond the position of equal pressure in the ribs around their entire area, the ribs would thereby be pulled forward, losing their flexibility at the point of contact with the dorsal spine, thus bringing the weight of the thoracic wall out of position, or alignment, in relation to the skull and pelvis. The result would obviously be a tightening of all muscles and ligaments of the vertebrae of the dorsal spine. This would tend to produce an increased lordosis of the lumbar spine; as any lack of freedom in one part of the spine requires compensatory movement in adjoining parts. With continued repetition this position tends to perpetuate itself, and finally becomes a habit. The muscles and ligaments adjust their structures to the constant strain and we lose our sense of normal balance through what we might term a "false consciousness." With this false consciousness, or self-consciousness, coördination, or the mechanical reflex action of the various parts in movement, is lost to a large extent.

If the chest is lifted, the entire structure is laboring under a mechanical disadvantage. For many years this has been one of our glaring mistakes in physical education.

If the thorax and the pelvis are in equilibrium, thus freeing the articulating surfaces of the ribs with the dorsal spine, the spinal muscles will be released for coördination, and the lumbar spine will have a tendency to maintain its normal curve. Fixation of the muscles of the dorsal spine, with increased lordosis of the lumbar spine, throws the weight forward and thus weakens the support of the fifth lumbar, allowing it to slip forward, and this, in turn, tends to increase the obliquity of the pelvis, as will be shown presently under "Mechanics of Hip-joint." By increased obliquity of the pelvis, the muscles connecting the head of the femur with the acetabulum, would have an inequality of pull and the weight of the torso is thereby brought out of alignment with its foundation, and its support at the head of the femur weakened. Any inequality of pull of the muscles of the lumbar spine, or of the muscles supporting the femur in the acetabulum, produces an uneven balance of the weight of the structure upon the head of the femur, with resulting strains and the consequent loss of the free action of the hip-joint. This will not only bring a strain upon the muscles of the pelvis and of the hip-joint, but will also produce a strain upon the spine, owing to the unequal pressure upon the vertebrae and the inevitable compensatory action of the fifth lumbar.

An unequal pull of the deep-lying muscles and ligaments around the head of the femur would make normal functioning at this point difficult, if not impossible. The superficial muscles are thus called upon to assume part of the responsibility of supporting the weight of the body. In a general way, the function of the deep-lying muscles might be regarded as that of maintaining a pull upon weight back toward center; and the function of the superficial muscles, that of pulling weight away from center, as in the voluntary movements of the limbs* This interplay of deep-lying and superficial muscles of the body equalizes inner and outer stress, thus maintaining equilibrium. The result is perfect coördination, and the weight of the body is carried with the least expenditure of effort.

Through coördination of the many groups of muscles of the body, there results a unity of force which secures freedom of action in all parts. The bony structure should be so balanced that every ligament and muscle receives the least possible strain, and every muscle of the body is ready for active coördination in the readjustment in the various units of weight, necessitated by movement. In a natural or perfectly balanced structure, every organ would be in a position for best functioning, and there would be a normal relation of all parts of the mechanism. This balance of parts should be maintained in movement as well as when the structure is at ease. If the weight of the pelvis is balanced in proper relation to the weight of the thorax at their mean center, as has been explained, it will be seen that the articular surfaces of the sacrum and the fifth lumbar vertebra will be in normal contact. The contact of this articulation is normal when the weight of the vertebrae of the spine rests evenly upon the sacrum, and all spinal muscles are free for coördination, otherwise weight of the spine would be maintained at a disadvantage. The amount of weight to be adjusted is not important. The significant fact is that all structures, and parts of structures, must be balanced. Each integral part of a structure must rest evenly upon that part directly beneath it if freedom from strain, and coördination of parts is to be attained. With the articulation of the fifth lumbar and the sacrum normal, the lumbar spine will retain its natural curve and the deep-lying muscles of this region will have their proper alignment, or their normal perpendicularity. This will bring the weight of the torso upon the center of the head of the femur in its contact with the acetabulum.

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* By the superficial muscles are meant all muscles involved in the voluntary movements of the extremities.

Faulty adjustment of weight at one point always implies mechanical readjustment or necessary reaction of another point to compensate; and so we note that the interdependence of parts of the whole structure in its bony articulations and between its muscular groups is such as to produce great disadvantage to the structure if local freedom at any articulation is not maintained.

### THE RELATION OF THE HEAD OF THE FEMUR TO THE ACETABULUM AND THE NORMAL MECHANICS OF THE HIP-JOINT.

If the entire weight of the body rests evenly upon the head of the femur the psoas and the iliacus muscles would have their normal alignment. These muscles give the femur muscular support at the front (See Plate IV.). With these muscles functioning normally, the weight of the leg, when in motion, is suspended from the center of the torso. The nearer weight is maintained in the center of a structure, the better. In obedience to this law, the leg has support from within the torso by the above deep muscles, while the superficial or voluntary muscles swing the weight of the leg in walking. For a mechanical example, let us suspend a fifty-pound weight on an iron chain from the ceiling and throw out from it a dozen ribbons to as many children,—you have formed a May-pole. Any child may pull on its ribbon in any direction and swing the weight, but the weight is still supported by the chain.

### LIGAMENTOUS SUPPORT OF THE HIP-JOINT.

In the following illustrations we observe three aspects of the hip-joint and its ligamentous support. In Plate I we see the strength of the bony fibre in the head of the femur at the center of support and the apparent equality of pull of the deeper ligaments maintaining the femur in normal position.

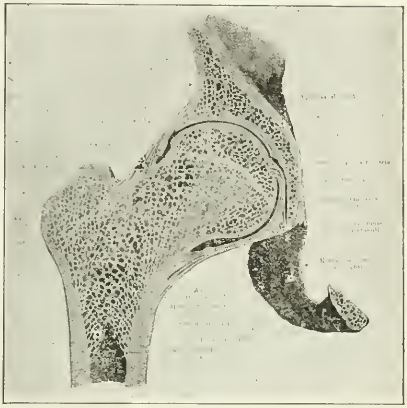

Plate I.—All plates taken from Hand Atlas of Human Anatomy by Werner Spalteholz.

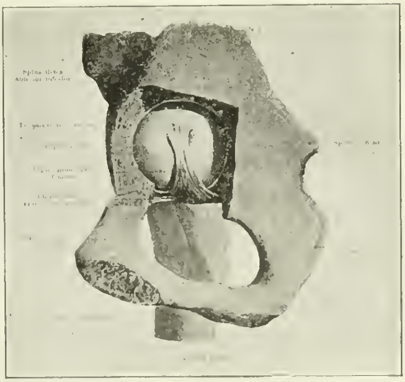

Plate II.—The hip-joint is shown as it appears from within.

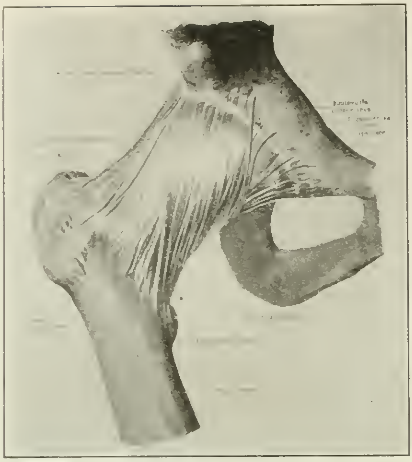

PLATE III shows the various layers of ligaments which, in their cross-fibered alignment, afford strength of support and, at the same time, a resiliency which affords freedom of movement in the joint in response to muscular pull.

If the weight of the three bony groups or units, the pelvis, the thorax, and the skull, were adjusted at the median line, an equalized stress at all parts of each group would result. The weight of the whole would then rest evenly upon the head of the femur, thus freeing its articulation with the acetabulum from unequal strain. With all muscles and ligaments of this articulation in equalized tone, and the body-weight balanced upon the femur, this joint would retain its normal functioning under all conditions, and the spine would remain free from any compensatory action at the fifth lumbar and the sacrum. To have this adjustment, we must have all articulations of the spine and of the pelvis free, and all connecting tissues in a normal state of elasticity. Especially must there be perfect freedom and equality of play of the muscles of the hip-joint. This joint tends, in a way, to act as a shock absorber to protect the spine and the torso from the weight of the body in its contact with the earth, and the consequent jar. Every time we step, our one hundred and fifty pounds weight has to be transferred through this articulation to the feet. The ligaments of this articulation, or joint, lose much of their power as shock absorbers if the muscles connecting the femur with the pelvis are unequal in their play. If one recalls the insertion and position of these various muscles, it will be seen that the area of origin inside the pelvic wall is far greater than the point of insertion in the head of the femur.

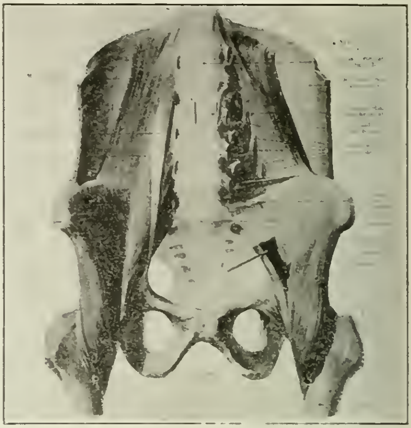

PLATE IV.

In Plate IV, the psoas and iliacus muscles are shown supporting the head of the femur at the front. The psoas, having its origin at the intervertebral discs and lateral surfaces from the twelfth thoracic to the fifth lumbar vertebra, and its insertion in the fascia iliaca, aids in maintaining the normal obliquity of the pelvis and in supporting the femur at the front.

The iliacus rising at the anterior surface of the ilium fascia iliaca, and spina iliaca, anterior, superior, and inferior forms a circular surface lining the ilium. It converges downward in front of the hip-joint, and is inserted in the lesser trochanter. Its origin being on the inside of the ilium and its insertion in the head of the femur indicates its function as that of giving the femur support at the anterior rim of the acetabulum .

The muscles at the back which aid in supporting the head of the femur in normal position are the piriformis and the obturators, as seen in Plate V. It will be recalled that the piriformis has its origin at the inner surface of the sacrum, and converging, its fibers run through the foramen ischia of the ischium, lateralward to the tip of the great trochanter. The obturator internus arises on the medial surface of the inner side of the ischium, and bending at right angle, passes to its insertion at the back of the great trochanter. The obturator externus is included in this group. The above muscles give the femur support at the back and the psoas major and the iliacus give it support at the front, whereas the rectus abdominus, the psoas minor, and the quadratus lumborum aid in maintaining the normal obliquity of the pelvis. Added to these deep-lying muscles are the lower back muscles, the abdominal oblique and the transversus. The ligaments connecting the great trochanter and the head of the femur to the acetabulum would have equal stress if all of these muscles were properly performing their function and the weight of the torso would rest evenly upon this joint.

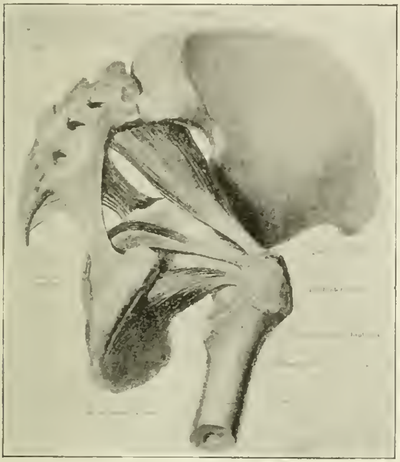

Plate V.

If we incline the body forward in preparation for a step with the weight of the pelvis and of the thorax in proper adjustment at the median line, the torso evenly balanced upon the head of the femur, the ligaments and muscles controlling the action of the hip-joint will be free, and the leg will swing forward supported by the equalized play of the deep-lying muscles mentioned above.

The circular area at the origin of these muscles in the pelvis, with each muscle converging to a tendinous point at its insertion in the femur, affords a resistance to all outward movements of the leg and receives the recoil of outward thrusts. This action may be likened to that of the wire spokes of a bicycle wheel. The pull upon the wire spokes must be absolutely equalized at the rim of the wheel. Otherwise it is obvious that the weight from above, and an irregularity of contact at any point of the rim of the wheel in traveling, would produce too great a strain or concussion upon the rim, and the structure would break at its point of least resistance. Such shocks of weight and concussion must be absorbed somewhere in the mechanism, and if the spokes are all of equal tension, the strain will be equally distributed: otherwise the strain would fall upon the main structure of the framework.

The function of the hip-joint may be likened in anatomical construction and physiological functioning to such a mechanism. Plate VI is a diagramatic drawing suggesting this point.

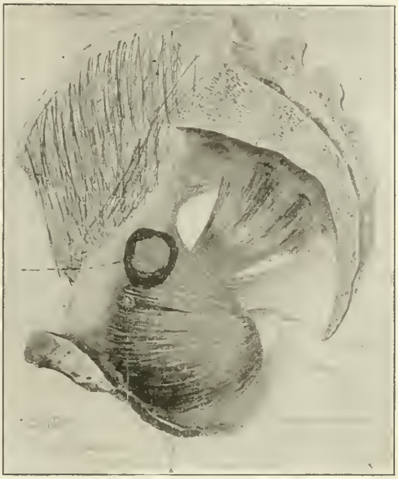

Plate VI.

If the iliacus muscle were shown in this plate, one would note the circular area of the origin of the hip muscles on the inside of the pelvis; and these muscles, the iliacus, psoas, obturator and piriformis in their diverging fibers, suggest the spokes of the bicycle wheel.

If equality of play of all the deep-lying muscles of this joint is not maintained, its freedom is lost and the spine must receive the recoil which should be absorbed in great part at this joint. Inner and outer stress must be equalized in a structure, if perfect equilibrium and full power of the structure is to be maintained. The evidence of this law of physics may be observed in annealing glass and steel. To obtain the greatest power of resistance to external forces, stresses originating within the structure must be equalized as far as possible to enable it to withstand greater stress from without. This principle is also shown in all mechanical action. Every outward impulse of a structure must be balanced by inner stress to absorb the recoil. If this were not true, there would be no power in the outward thrust, as there would be no resistance, and if there were no resistance, the body behind the thrust would go with it.

For example, the power expended in the leg which kicks a football across the field must be resisted by an equality of stress somewhere within the structure, and this area of resistance must equalize the stress of all muscles concerned in the action. If not absorbed in the legitimate joint at the head of the femur and the acetabulum, through the equalized support of all the deep-lying tissues of that articulation, and the equalized resistance of the fibers of these tissues at their origin, compensatory action and thereby strain, must be conveyed to the spine. This would weaken the muscular support around the fifth lumbar and the sacro-iliac.

To repeat, if a boy kicks a football, the number of pounds pressure required for that kick must be sustained by resistance somewhere within the body. If the inner muscles of the pelvis are perfectly free and equalized in action and stress, the weight of the body will be maintained upon the head of the femur, and the same muscles which are aiding in the maintenance of this equilibrium of weight will receive the recoil and the shock of the forward impetus of the leg. Any lack of freedom or action in these muscles, and the shock of the leg movements will then be delivered to the spine by compensatory action at the fifth lumbar.

Briefly, the hip-joint is like a wire-spoke bicycle wheel; the head of the femur being the weight-carrying hub, and the obturators and the iliacus the radiating spokes, which maintain the equality of stress within the rim necessary for the equal distribution of resistance. Also, like the wheel, the inherent tension in the ligaments and the muscular fibres, holds the head of the femur in equalized suspension in the acetabulum, ready to transmit without slack or undue rebound, the anticipated stress received or imposed in action.

We recognize that the spine should always be protected from uneven or irregular stress or recoil from the activities of the extremities, or the reactions of the weight or concussions of the body. Lack of normal functioning in any legitimate joint conveys the irregular strain to the spine, and its unity of action and reaction is lost. Fix any point, and you bring a strain upon the whole unity of action, due to the interdependence of all integral parts of the structure. For a simple example of this, if one were to place the fingers on the cervicle vertebrae of a subject (who is standing in a relaxed position), and ask him to throw the hips back and thus increase the curve of the lumbar spine, an increased curve in the cervical spine will also be noted, provided the subject maintains freedom of the superficial muscles of the neck so that the mechanical reaction in the spine may be felt in the vertebrae.

As a summary of the foregoing principles, it may be said that when an inert mass is maintained with equal stress at all points in all directions, it is in equilibrium. Our weight is maintained in the bones of the structure, therefore, if there be equal stress upon all points in all directions, they would be maintained in equilibrium with the least expenditure of muscular effort. If this mechanical fact is one of the governing factors of the human structure, then the bony articulations would be found free at all points of their contacting surfaces when weight of the bony structure is so balanced as to produce equal stress at all points in all directions. We must find such a position for the maintenance of the weight of the structure as will secure the greatest protection to the whole organism, especially to the spine, from the strain and jar o fthe varying adjustments of the weight when in motion. One of the principal joints for this protection is the articulation of the head of the femur with the acetabulum. With proper resiliency at this joint and equalized action of all its muscles and ligaments, we have the necessary mechanical adjustment for absorbing the recoil from the varying outward thrusts of the leg and the consequent shifting of weight.

In conclusion, structures aiding to maintain the obliquity of the pelvis and the free articulation of the hip-joint are the following muscles: psoas major and minor, piriformis, obturators, and the ligaments of the sacro-iliac and those connecting the head of the femur with the acetabulum and the fascia of the spinal muscles in the lower part of the back.

We also have the muscles of the abdominal wall, particularly the rectus abdominis. Upon these deep-lying tissues largely depends the balance of the weight of the torso upon the head of the femur, and the determination of the obliquity of the pelvis. Therefore freedom of all these tissues is absolutely necessary to insure perfect balance of the weight of these parts.

## Book Reviews.

*Hygiene of Communicable Diseases.* By Francis M. Munson, M. D. Paul B. Hoeber. New York. 1920.

An excellent manual of information, available at the present time concerning the epidemiology and the management on sea and land of communicable diseases, is contained in this volume, "Hygiene of Communicable Diseases." The subjects of epidemiology, prophylaxis, and sanitation are presented in concise, readily accessible form, in such a way as to be of practical value to the physician, sanitarian, sanitary engineer, missionary or medical officer. The carefully headed sections, sub-sections, and paragraphs, make this book an unusually helpful one for reference in emergencies A chapter devoted to a new subject, sanitary measures following great disasters, is of considerable interest and practical value. Naval sanitation, railway sanitation, municipal and rural sanitation, and sanitation in schools, prisons, and industries are among the topics to which detailed consideration is given. The second part of the book describes diseases spread by oral and nasal discharges, the fecal-borne diseases, the venereal diseases, insect-borne diseases, diseases spread by infected animals, and wound infections. This book is an excellent treatise of an important subject.

*Publications from the Dermatological Research Laboratories of Philadelphia.* Vol. II. 1920. Collected Reprints.

The Dermatological Research Laboratories were instituted in 1912 by a citizen of Philadelphia and supported by him for four years. During this time, the work of research was mainly on the lines of psoriasis, and resulted in the publication of a number of essays on this subject. Later, it was found that the laboratory facilities authorized a broader research and the production and study of new chemical compounds designed to destroy the germs of various infectious diseases were undertaken. At first, the investigations dealt chiefly with mercury compounds; later, they began the elaboration of arsenic compounds. At about this time the supply of salvarsan threatened to be cut off on account of the war, and a successful attempt was made in the laboratories to reproduce this complicated chemical compound. Under the name of arsenobenzol, salvarsan was made and distributed to hospitals and physicians throughout the United States. The profits made from the sale of this drug have been and are being used to support the medical research laboratories, and this has resulted in the publication of over seventy contributions to science.

The present is Volume II of the Collected reprints of the laboratories' publications, and comprises thirty-two papers, published in a number of different periodicals. The director of the staff is Dr. J. Frank Schamberg, his assistants being Drs. John A. Kolmer and George W. Raijiss, and a majority of the papers are by these men, sometimes with the assistance of the auxiliary staff. Naturally, syphilis, and especially its modern methods of treatment and the study of the chemical compounds used therapeutically, are the subjects of a large number of the essays. Some studies of the etiology of influenza, of the pneumococcus, and of the diphtheria bacillus, are included. As would be expected from the names of the authors, these essays are all of high scientific value, and offer a notable contribution to the American literature on these important subjects.

## MEDICAL REGISTRATION IN MASSACHUSETTS.

The results of the May examinations conducted by the Board of Registration are as follows:

| Graduation from | Registered | Rejected |
|---|---|---|
| Massachusetts College of Osteopathy | | 3 |
| Kentucky School of Medicine | | 1 |
| Tufts Medical School | | 2 |
| College of Physicians and Surgeons of Boston | 1 | 2 |
| Middlesex College of Medicine and Surgery | 1 | 7 |
| College of Physicians of University of Southern California | | 1 |
| Woman's Medical College, Pa. | 1 | |
| Laval | | 1 |
| University of Valdimir | | 1 |
| University of Maryland | | 1 |
| University of Lisbon | 1 | |
| College of Physicians and Surgeons of Baltimore | | 1 |
| Baltimore Medical College | | 1 |
| Fordham | 1 | |
| | 5 | 21 |

THE BOSTON
Medical and Surgical Journal
*Established in 1828*

THURSDAY, JUNE 16, 1921

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## THE A. M. A. CONVENTION IN BOSTON.

THE meeting of the A. M. A. is now a matter of history. The attendance shown by registration of 5500 members is next to the largest in the history of the Association, being exceeded by about fifty in the Chicago Convention of 1918. The attendance at sections was unusually large and the quality of papers presented high. As usual, surgery and its specialties attracted the larger numbers, but unusual attention was paid to public health questions.

The social events were very generally participated in, the reception at the Harvard Medical School attracting a great number of members and guests.

The sessions of the House of Delegates were evidently of unusual interest, judging from the reverberating echoes which could not be restrained by closed doors and guarded reports of delegates. Since the House of Delegates felt obliged to go into a committee of the whole for the purpose of discussion, and then excluded the few unofficial spectators with the explanation that some things might be said which would be unfit for general report, one may wonder who was suspected of indiscretions. Possibly the published reports were carefully censored, for members of the House were evidently amused by retrospection of the speeches or behavior.

The affairs of the Association are of so much importance that constituent bodies should not only send the highest type of men to represent them, but keep such men on the delegation, in order that, through continuity of service, the greatest influence may be exerted. The Massachusetts custom of comparatively short service on this delegation is to be deprecated. To be useful in the highest degree, a person should follow the doings of this body through as many years as he may be willing to contribute his service, so that through association with others and accumulated knowledge of the history of the Association's affairs, one may represent his constituents most effectively.

As an illustration, the custom of the Suffolk District of the Massachusetts Medical Society in limiting the term of service of its members on the Council, is believed by many to be very unwise, for a useful and influential person may exert greater influence through extended experience.

The action of the House of Delegates in dealing with the question of State Medicine, rejected the first report of the committee and adopted a very simple resolution approving and endorsing all proper activities and policies of state and federal governments directed to the prevention of disease and the preservation of public health. Everybody would agree to that, but this resolution was diplomatically vague, and leaves the interpretation open to any one.

The question of the attitude of the Association on the problems relating to the use of alcohol by the profession, was also left in a very indefinite state, and merely expressed disapproval of the behavior of a small minority of the profession who seem to be in "the position of being purveyors of alcoholic beverages." The scientific estimate of the value of alcohol in medicine is therefore left as before.

The election of Dr. George Edmund de Schweinitz to the presidency meets with universal approval, both because of the personal qualifications of Dr. de Schweinitz and also because there is a very general feeling that this office should be filled by a man who is representative of the highest scientific attainments as well as possessing qualities of leadership.

To some persons, the advantages of the custom of electing a speaker may be questioned, for the influence of a president might be used to better advantage in controlling the deliberations of the House of Delegates and in that way dealing directly with the functions of the Association.

The general arrangement and management of the meeting reflect great credit on Dr. F. B. Lund and his committees, and have demonstrated qualities of leadership and breadth of view which would warrant recognition by promotion to higher official positions.

Dr. Burrage's communication made public the appreciation of the officers of the Association for the hospitality extended by the Massachusetts Medical Society.

## THE TRUE SIGNIFICANCE OF ETHER DAY.

ONE of the most interesting features of the clinical exercises incident to the Section meetings of the American Medical Association, was the address of Dr. J. Collins Warren in the surgical amphitheatre at the Massachusetts General Hospital.

Dr. Warren used very few notes, much of the address being extemporaneous, in which he contrasted the methods employed before the use of ether to produce relaxation and some diminution of pain, and thereby emphasized the blessings of anaesthesia.

The address in full would be of great interest, but not being written, is not available. Dr. Warren, however, has kindly furnished the subjoined abstract of his discourse.

### THE TRUE SIGNIFICANCE OF ETHER DAY.

Dr. J. Collins Warren addressed the surgical meeting of the American Medical Association at the Massachusetts General Hospital on "The True Significance of Ether Day," on June 7, at twelve o'clock.

Dr. Warren called attention to the fact that it had been stated that the controversy connected with the discovery of surgical anaesthesia had obscured its true origin, but he said these conditions surrounded the beginnings of all great discoveries. Who would think of the steamboat without associating it with the name of Fulton; or think of the telegraph without associating it with the name of Morse; or, of the telephone without coupling it with the name of Bell? And yet years of litigation, as many of us personally know, followed the introduction of the telephone, and so we find the discovery of surgical anaesthesia no exception to the general rule. A decision has recently been reached by the Senate of the University of New York, based on recommendations from distinguished representatives of its electral board from every state in the country, giving Dr. William T. G. Morton a place in the Hall of Fame.

It is true that other individuals experimented also with ether, but not to a convincing degree, and therefore failed to affect in any way the surgical practice of the time.

On October 16, 1846, Dr. Morton administered ether to a patient for a major operation in surgery at the Massachusetts General Hospital. The experiment was so successful that it was followed immediately by other operations on following days. As Dr. Henry J. Bigelow pointed out, this experience showed three important things,—the safety, the certainty and the universal applicability of the agent employed in relieving pain in surgical operations.

It was a practical demonstration of what had been dreamt about for many years, and it was this triple feat that constituted the "Discovery" and entitled October 16, 1846, to have a special name like that of our national holiday. Whereas, the Fourth of July is called Independence Day, the date we are considering—October 16, 1846—should be called Ether Day, for both ushered in the dawn of a new era.

The work of Long, Wells and Jackson in no way affected surgical practice. It was not until the convincing experiment of Morton was made, in the dome of the amphitheatre of the Massachusetts General Hospital, that it became at once apparent to all the world that surgical anaesthesia had become a reality and that "pain was no longer the master, but the servant, of the body."

## THE ANNUAL REPORT OF THE MASSACHUSETTS GENERAL HOSPITAL FOR THE YEAR 1920.

LIKE nearly all hospitals, the Massachusetts General was handicapped by insufficient funds and, during the year, the Trustees appointed a committee to obtain subscriptions to an endowment fund. Four hundred thousand dollars was pledged, and about one-half has been paid. The object of this particular fund is to provide for additions and changes in the plant. the total of the payments for this fund, together with bequests, donations. additions and subscriptions to the general fund, amounted to $707,000.

The increased cost of fuel and food was $79,776.97, and the deficit of the year was $57,000.

The eighteen professional divisions of the hospital have required larger expenditures in order to maintain their several functions.

Especial reference is made to the follow-up department which deals with patients during convalescence, after leaving the hospital.

The McLean Hospital has been able to resume scientific investigations without lowering standards of admission, and has now more than one-fourth of its patients on the free list. The report touches upon the need for a hospital for persons of moderate means, and the expectation that resources will be provided whereby this service can be given.

The three important functions of a great hospital are emphasized, *viz.*, the care of the sick, the development of good doctors and adequate training of nurses.

Less attention, in the report, is given to details of medical and surgical service than was formerly the custom with many hospitals, so that one who cares to work out the results of treatment from an analysis of the cases, would find the task difficult. The business and administrative activities are clearly set forth and furnish a model for other hospitals.

* * *

## MEDICAL NOTES.

The American Medical Association has formally pledged its support to the Federal plan of a Separate Department of Public Welfare, and has offered to coöperate in every way.

The Association has appointed a committee to coöperate with Brig.-Gen. Sawyer in preliminary organization work. Members of the committee are: Dr. George E. de Schweinitz of Philadelphia, now President of the Association: Dr. Thomas S. Cullen of Baltimore, Dr. Frank Billings of Chicago, and Dr. Charles W. Richardson of New York.

Instructive District Nursing Association. —The significance of any health conditions brought out by the work of the Instructive District Nursing Association is due, not to the number of cases handled, but to the fact that the nurses are busy daily in every variety of existing home in every residential district of Greater Boston, and that their findings present, in consequence, what might be called a cross section of health conditions throughout the city. The pulse of the work is, of course, the new patients.

The normal increase of such patients in any one year in any large visiting nurse association, is 2,000. Last year, in Boston, it was 10,000, an increase phenomenal in the history of all district nursing associations, which was due, not to epidemics or emergencies, but was directly the result of a wider knowledge of the existence of the nurses among those who needed them. Such a rate of growth is not to be expected this year; in fact, if last year's gain can be maintained, it will be rather remarkable.

May was a relatively quiet month. Compared with the same month last year, however, it showed an increase in new patients of about 8%—2,553 for May, 1921; 2,358 for May, 1920.

The outstanding feature throughout the spring has been the prevalence of pneumonia, with which, in certain districts, notably East Boston and the North End, many people have been so exceedingly ill as to bring a very heavy pressure on the nurses. May showed a marked lightening in the number of pneumonia cases, though they were still heavier than in May, 1920—99 cases in May, 1921; 68 cases in May 1920. The really encouraging fact is that the death rate is lower.

May also saw an increase of 23% in visits to expectant mothers, an increase significant to future Bostonians, in view of the known fact that the saving of babies' lives depends in large measure on prenatal care.

The four Child Health Clinics which were held during the month, brought up the enrollment of children to 195. Only 15 of these were found to be without a defect.

### BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending June 11, 1921, the number of deaths reported was 195 against 199 last year, with a rate of 13.42 against 12.84 last year. There were 32 deaths under one year of age against 41 last year.

The number of cases of principal reportable diseases were: Diphtheria, 50; scarlet fever, 34; measles, 111; whooping cough, 13; typhoid fever, 1; tuberculosis, 52.

Included in the above, were the following cases of non-residents: Diphtheria, 2; scarlet fever, 1; measles, 1; typhoid fever, 1; tuberculosis, 7.

Total deaths from these diseases were: Diphtheria, 2; scarlet fever, 2; whooping cough, 1; tuberculosis, 18.

Included in the above, were the following cases of non-residents: Diphtheria, 1; tuberculosis, 1.

## The Massachusetts Medical Society

### ANNUAL MEETING OF THE COUNCIL, MAY 31, 1921

The annual meeting of the Council was held at the Boston Medical Library, 8 The Fenway, Boston, May 31, 1921, at 5 P.M. The President, Dr. Alfred Worcester, was in the chair and the following 108 Councilors present:

Berkshire,
G. H. Thompson, North Adams, V.P.
A. P. Merrill, Pittsfield.
P. J. Sullivan, Dalton, M.N.C.

Bristol North,
Sumner Coolidge, Middleborough, V.P.
W. H. Allen, Mansfield.
F. A. Hubbard, Taunton, M.N.C.

Bristol South,
A. W. Buck, Fall River.
E. F. Cody, New Bedford, M.N.C.
R. W. Jackson, Fall River.
J. C. Pothier, New Bedford.

Essex North,
R. V. Baketel, Methuen.
J. F. Burnham, Lawrence.
T. R. Healy, Newburyport, M.N.C.
G. E. Kurth, Lawrence.
J. J. O'Sullivan, Lawrence.
F. B. Pierce, Haverhill.
F. E. Sweetsir, Merrimac.

Essex South,
P. P. Johnson, Beverly, V.P.
S. P. F. Cook, Gloucester.
W. T. Hopkins, Lynn.
J. F. Jordan, Peabody.
W. G. Phippen, Salem, M.N.C.
R. E. Stone, Beverly.

Franklin,
H. G. Stetson, Greenfield, M.N.C.

Hampden,
F. H. Allen, Holyoke.
E. P. Bagg, Jr., Holyoke, M.N.C.
Philip Kilroy, Springfield.

Middlesex East,
G. F. Dow, Reading, V.P.
L. M. Crosby, Wakefield.
E. D. Richmond, Reading.

Middlesex North,
J. A. Mehan, Lowell.

Middlesex South,
E. H. Bigelow, Framingham, V.P., C.
E. A. Andrews, Newton.
E. W. Barron, Malden.
F. G. Curtis, Newton.
John Duff, Charlestown.
G. W. Gay, Chestnut Hill, Ex-P.
F. J. Goodridge, Cambridge.
L. S. Hapgood, Cambridge.
C. E. Hills, Natick.
F. R. Jouett, Cambridge.
H. J. Keaney, Everett.
C. E. Mongan, Somerville.
H. S. Rowen, Brighton.
W. D. Ruston, Somerville.
L. F. Sise, Medford.
F. G. Smith, Somerville.
C. H. Staples, Malden.
E. H. Stevens, Cambridge, M.N.C.
A. K. Stone, Framingham Center, Treas.
F. R. Stubbs, Newton.
Alfred Worcester, Waltham, P.

Norfolk,
C. E. Allard, Dorchester.
W. B. Batchelder, Dorchester.
E. H. Baxter, Hyde Park.
E. H. Brigham, Brookline, Libra.
A. N. Broughton, Jamaica Plain, M.N.C.
T. F. Greene, Roxbury.
F. C. Jillson, West Roxbury.
G. W. Kaan, Brookline.
W. B. Keeler, Roxbury.
F. P. McCarthy, Milton.
H. H. Powers, Brookline.
Victor Safford, Jamaica Plain.
G. H. Scott, Roxbury.
Augusta G. Williams, Brookline.

Norfolk South,
F. E. Jones, Quincy, V.P.
C. S. Adams, Wollaston.
O. H. Howe, Cohasset.
G. H. Ryder, Quincy, M.N.C.
G. M. Sheahan, Quincy.

Plymouth,
C. E. Lovell, Whitman.
Gilman Osgood, Rockland.
F. G. Wheatley, North Abington, M.N.C.

Suffolk,
F. B. Lund, Boston, V.P.
J. L. Ames, Boston.
S. H. Ayer, Boston.
Robert Bonney, East Boston.
F. J. Cotton, Boston.
Lincoln Davis, Boston.
Channing Frothingham, Boston, C.
W. J. Gallivan, South Boston.
J. E. Goldthwait, Boston.

G. S. Hill, Boston.
W. C. Howe, Boston, M.N.C.
D. F. Jones, Boston.
F. T. Lord, Boston.
R. H. Miller, Boston.
J. J. Minot, Boston.
F. S. Newell, Boston.
W. H. Robey, Jr. ,Boston.
Stephen Rushmore, Boston.
Myles Standish, Boston.
Louisa P. Tingley, Boston.

Worcester,
F. H. Baker, Worcester.
W. P. Bowers, Clinton, Ex-P.
W. J. Delahanty, Worcester.
G. A. Dix, Worcester.
M. F. Fallon, Worcester
R. W. Greene, Worcester.
David Harrower, Worcester, M.N.C.
L. C. Miller, Worcester.
G. O. Ward, Worcester.
F. H. Washburn, Holden.
S. B. Woodward, Worcester, Ex-P., C.

Worcester North,
W. E. Currier, Leominster, M.N.C.
H. R. Nye, Leominster.
A. H. Quessy, Fitchburg.

In the absence of the Secretary, Dr. Walter C. Howe, a Councilor of Suffolk was duly nominated and elected *Secretary pro tempore.*

The reading of the record of the last meeting was dispensed with and the record adopted as printed. The Secretary read the names of the Nominating Committee; these members and alternates responded to their names and retired:

Berkshire,
P. J. Sullivan.

Bristol North,
F. A. Hubbard.

Bristol South,
E. F. Cody.

Essex North,
T. R. Healy.

Franklin,
H. G. Stetson.

Hampden,
P. Kilroy.

Middlesex South,
E. H. Stevens.

Norfolk,
A. N. Broughton.

Norfolk South,
G. H. Ryder.

Plymouth,
F. G. Wheatley.

Suffolk,
W. H. Robey, Jr.

Worcester,
David Harrower.

Worcester North,
W. E. Currier.

The committee appointed to consider the petition of F. Drew to be restored to the privileges of fellowship reported favorably. Committees were appointed to consider similar petitions from E. M. Harding, M. C. von Groll, W. T. Bailey, G. E. Allen and A. J. Collins. Each committee reported favoring the restoration of each fellow, provided he paid what he owed the Society at the time he was deprived, plus the dues for the current year, within one month from May 31, 1921. The Council accepted all the reports and adopted their recommendations.

Dr. C. H. Lawrence reported for the Standing Committee of Arrangements, stating that the committee's plan for carrying on the annual meeting had been submitted in October and accepted by the Council at that time. When making the Budget in February, however, the sum asked for, $2,955, had been reduced to $500, so that it had been necessary to cancel the contracts already made and to so arrange with the Copley-Plaza that 500 dinners at $2.50 apiece were guaranteed to that hotel. He thought that the Council ought to stand by the Committee of Arrangements or express, at a suitable time in advance, what were its wishes in the matter of the annual dinner. Accommodations must be secured and all plans made long before the meeting, and he urged the Council, in future, to make up their minds what they wanted in the way of a free dinner, or one paid for by those who attend. The question was discussed by Dr. F. B. Lund, Dr. S. B. Woodward and Dr. R. H. Miller, and the Chairman. No action was taken.

Dr. S. B. Woodward presented the report of the Committee on Membership and Finance, as to membership, and it was accepted, and its recommendations adopted.

### Report of the Committee on Membership and Finance as to Membership.

The Committee on Membership and Finance makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire under the provisions of Chapter I, Section 5, of the By-Laws:

Howard Mendenhall Buck, of 857 Beacon Street, Boston.
James Robert Fuller, of Andover.
Justin Gideon Hayes, of Williamsburg.
Patrick Henry Keefe, of Providence, with remission of dues for 1921.
Edwin Porter Linfield, of Montello.
Joseph Smith Lockhart, of Cambridge, with remission of dues for 1921.
Arthur Morey Round, of Norton, with remission of dues for 1921.

2. That the following named Fellows be allowed to resign under the provisions of Chapter I, Section 7, of the By-Laws:

Jennie McIntosh Arey, with remission of dues for 1921.
Carl Hermann Bucholz, of Halle, Germany, with remission of dues for 1921.
Heber Howe Cleveland, of Portland, Maine, with remission of dues for 1921.
Henry Levi Davis of Battle Mountain, Nevada, with remission of dues for 1921.
Frank Collins Dunbar, of 38 Bromfield Street, Boston, with remission of dues for 1921.
Clarence Henry Hyman, of Cleveland, Ohio, with remission of dues for 1921.
Julia Grice Kennelly of 1 Kennedy Road, Cambridge, with remission of dues for 1921.

Marion Edwena Kenworthy, of New York, with remission of dues for 1921.
Cosa Dell Haskel Lindberg, of Lincoln, Nebraska, with remission of dues for 1921.
David Oscar Nathaniel Lindberg, of Denver, Colorado, with remission of dues for 1921.
John Foley Martin, of Trenton, New Jersey, with remission of dues for 1921.
Frank Adelbert Morse, of 11 Lincoln Street, Lynn, with remission of dues for 1921.
Dr. Albie Warren Sylvester, of Pittsfield, with remission of dues for 1920 and 1921.
Edward Bancroft Towne, of San Francisco, California, with remission of dues for 1920 and 1921.

3. That the following named Fellows be allowed to change their membership from one district society to another without change of legal residence, under the provisions of Chapter III, Section 3, of the By-Laws:

Benjamin Frank Murray, of Jamaica Plain, from Norfolk to Suffolk.
Nathaniel Wales Faxon, of Stoughton, from Plymouth to Suffolk.
Samuel Breck, of Middleboro, from Bristol North to Norfolk.
Alfred Peter Chronquest, of Hathorne or West Roxbury from Essex South to Suffolk.
Francis Minot Rackeman, of 263 Beacon Street, Boston, from Norfolk to Suffolk.
George David Cutler, of 311 Beacon Street, Boston, from Norfolk to Suffolk.

4. That the following named Fellows be granted remission of dues under the provisions of Chapter I, Section 6, of the By-Laws:

Albert Alphonso Wood Ghoreyeb, of Jaffa, Palestine, for 1920 and 1921.
Charles Petit De Langle, of Yountville, California, for 1921.

For the Committee on Membership and Finance,
Samuel B. Woodward, *Chairman.*

He read the following report on finance, which was accepted and the suggestion that the assessment for resident Fellows for 1922 be $10, and for non-resident Fellows $6, was adopted by vote.

### Report of Committee on Membership and Finance as to Finance.

It is desirable to retain in the society as many as possible of our members who have established themselves outside of the state and, as such persons are unprotected by our malpractice act unless the trial takes place before a court of this Commonwealth and as they secure no benefit from dividends returned to the district societies, it seems to the Committee on Membership and Finance that, in establishing the assessment rate for the ensuing year, a distinction should be made between residents and non-residents, and they suggest to the Council that the assessment for the ensuing year be $10 for residents and $6 for non-residents. For your information it may be said that the number of persons affected by such non-resident membership is about 180.

Respectfully submitted,
S. B. Woodward, *Chairman.*

Dr. Channing Frothingham read the report of the Committee on Medical Education and Medical Diplomas, also his report as delegate to the Annual Congress on Medical Education, Licensure, Hospitals and Public Health, at Chicago, March, 1921. (See appendix, Nos. 1 and 2.).

The reports were accepted.

He presented this motion for his committee: *Moved,* That the President of the Society appoint a committee of not less than three to investigate the various medical cults, especially osteopathy and chiropraxy, with a view to ascertaining any therapeutic value there may be in these professions. This committee shall report to the Council with a view to having the Society educate the public, the medical profession and medical schools in regard to these special cults.

It was so voted.

The President appointed the following Committee: Channing Frothingham, Boston, *Chairman;* G. S. C. Badger, Boston; J. W. Sever, Cambridge.

The Secretary read Dr. J. S. Stone's report of the Committee on State and National Legislation (See appendix No. 3), and it was accepted.

Dr. Frothingham *Moved,* That a committee of not less than five be appointed by the President to investigate health problems in relation to the care of the sick in rural communities, to see if conditions can be improved and to report their results, with any recommendations, to the Council. The motion was seconded and so voted.

The President appointed as this committee:

Homer Gage, Worcester, *Chairman.*
H. M. Field, Norwood.
P. W. Goldsbury, Deerfield.
E. H. Place, Boston.
E. P. Richardson, Boston.

Dr. E. H. Bigelow read the report of the Committee on Public Health. (See appendix, No. 4.) Voted, to accept this report.

Dr. F. G. Curtis said that the Schick test had been used, voluntarily, in the city of Newton, 430 times since May 1, 1921.

Dr. A. K. Stone presented a report as Treasurer, and it was accepted. (See appendix, No. 5.)

Dr. E. H. Brigham presented a report as Librarian, and it was accepted. (See appendix, No. 6.)

In the absence of the Chairman, Dr. Frothingham read the report of the Committee of Nine. (See appendix, No. 7. )

The report was accepted and the President stated that he had in his possession a receipt for the dollar which had been paid for the purchase of the Journal and also the transfer papers. He asked the Treasurer to take charge of them for safe keeping.

Dr. W. P. Bowers, Chairman, read the report of the Committee of Seven to Study Measures for Maternity and Infant Welfare. (See appendix No. 8).

Dr. Bowers explained that an appropriation of $500 was asked for in order that the reports presented at the State House might be followed up and that his Committee might have clerical assistance. The Chair stated that this request must be referred to the Committee on Membership and Finance under the terms of Chapter IV, Section 8, of the By-Laws.

*Voted,* To accept the report and to continue the Committee, referring the request for an appropriation to the Committee on Membership and Finance.

Dr. E. F. Cody moved and it was *Voted,* That the Committee on Maternity and Infant Welfare be authorized to confer with the Committee appointed by the Clinical Congress of the American College of Surgeons, and with any committee of any organized medical society, or of this Council, for the purpose of securing information and coöperation whenever it is deemed advisable.

The report of the Committee on Cancer was read and accepted. (See appendix, No. 9.)

On proceeding to ballot for officers and orator for the year 1921-1922 it appeared that 89 ballots were cast, 85 for the ticket presented by the Nominating Committee and four blanks. The Chair announced the following elected:

*President:* John W. Bartol, Boston.
*Vice-President:* Brace W. Paddock, Pittsfield.
*Secretary:* Walter L. Burrage, Boston.
*Treasurer:* Arthur K. Stone, Framingham Center.
*Librarian:* Edwin H. Brigham, Brookline.
*Orator:* Henry Colt, Pittsfield.

The President nominated and the Council elected these committees for the year 1921-22:

### Standing Committees for 1921-1922.

OF ARRANGEMENTS.
Donald Macomber, A. W. Reggio, J. B. Swift, K. G. Percy, F. J. Callanan, Dwight O'Hara.

ON PUBLICATIONS AND SCIENTIFIC PAPERS.
E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

ON MEMBERSHIP AND FINANCE.
S. B. Woodward, A. Coolidge, Jr., Samuel Crowell, Gilman Osgood, Homer Gage.

ON ETHICS AND DISCIPLINE.
Henry Jackson, T. J. Robinson, David Cheever, F. W. Anthony, R. H. Seelye.

ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS.
C. F. Painter, J. F. Burnham, A. G. Howard, R. L. De Normandie, H. P. Stevens.

ON STATE AND NATIONAL LEGISLATION.
J. W. Bartol, F. G. Wheatley, E. H. Stevens, F. E. Jones, J. S. Stone.

ON PUBLIC HEALTH.
E. H. Bigelow, Annie L. Hamilton, E. F. Cody, Victor Safford, R. I. Lee.

COMMITTEE TO WORK WITH THE MASSACHUSETTS HEALTH COUNCIL.
Victor Safford, Boston; E. H. Bigelow, Framingham Center.

COMMITTEE TO CONFER WITH THE MASSACHUSETTS FEDERATION OF TEACHERS.
C. B. Fuller, Waltham; M. B. Hodskins, Palmer; Augusta G. Williams, Brookline.

COMMITTEE ON CANCER.
Edward Reynolds, Boston, *Chairman;* R. B. Greenough, Boston; J. Collins Warren, Boston; J. T. Bottomley, Boston; E. P. Richardson, Boston, *Secretary.*

COMMITTEE OF NINE. (FOR THREE YEARS.)
Channing Frothingham, H. D. Arnold, J. S. Stone.

Dr. Bowers bespoke uniformity in regard to paying the travelling expenses of members of the committees of the Society; he moved and it was *Voted,* That the Committee on Membership and Finance consider the question of paying mileage to members of committees of the Society and make a recommendation to the Council with a view to establishing a custom to be followed in the future.

On motion by Dr. W. G. Phippen, Dr. Charles Howard Bangs, of Swampscott, was voted the privilege of the floor to sketch the life of Dr. Samuel Fuller of Plymouth, passenger on the Mayflower, the first physician of New England, and to urge that the Massachusetts Medical Society take steps in this tercentenary year to make a suitable memorial to that eminent pioneer physician. The subject was discussed by Dr. Myles Standish of Boston, and on motion by Dr. Phippen it was *Voted,* That a Committee of Five be appointed by the President to consider some suitable memorial to Dr. Samuel Fuller. In accordance with this vote the President appointed as the Committee:

R. M. Green, Boston, *Chairman.*
C. H. Bangs, Swampscott.
G. O. Ward, Worcester.
Myles Standish, Boston.
E. D. Hill, Plymouth.

*Voted,* That the President appoint a delegate to the Second International Congress of Eugenics, to be held in New York City, September 22-28, 1921.

On motion by Dr. G. W. Gay, it was *Voted*, That the delegates of the Massachusetts Medical Society to the House of Delegates of the American Medical Association be instructed to oppose any modification of the resolution on the use of alcohol as a beverage and as a therapeutic agent passed by the House of Delegates at their meeting in New York, June 7, 1917. The vote was 52 in favor, 24 against.

Dr. W. D. Ruston offered the following preambles and resolution:

> Whereas, the New England Telephone and Telegraph Company is seeking to increase its tariff from the physician's use of the telephone, and,
>
> Whereas, the Public Utilities Commission of Massachusetts has granted a hearing to the "Somerville Medical Society," and others, in protest thereof, and,
>
> Whereas, the aforesaid commission has the matter now under advisement, therefore be it
>
> Resolved, that the Massachusetts Medical Society, through its council, petition the Public Utilities Commission, in protest against any increase in rates or change in the classification of physicians.

These were discussed by G. O. Ward, Philip Kilroy, A. H. Quessy, J. A. Mehan and A. H. Broughton, and being put to a vote were passed.

Dr. L. F. Sise introduced this motion, and it was seconded and passed: *Moved*, That the Massachusetts Medical Society favors the formation of a Section on Anesthesia by the American Medical Association, and that the delegates from this Society to the House of Delegates of the American Medical Association be instructed to that effect.

Dr. Bowers pointed out that a more thorough organization of the medical profession of the State is advisable in order that it may have more influence on medical legislation; impressed with this view, President Worcester had communicated with the presidents of the district medical societies with the object of gathering the eighteen districts into six groups; fourteen of the presidents were in favor of the scheme, one was opposed, and three had not answered. The tentative plan for the joint meetings of the district societies was as follows:

Group I.
- Berkshire,
- Hampden,
- Hampshire,
- Franklin.

Group II.
- Worcester,
- Worcester North.

Group III.
- Middlesex South,
- Norfolk,
- Norfolk South.

Group IV.
- Middlesex North,
- Middlesex East,
- Essex North,
- Essex South.

Group V.
- Suffolk.

Group VI.
- Plymouth,
- Barnstable,
- Bristol South,
- Bristol North.

He presented this motion:

> In order that the interests of the Massachusetts Medical Society, especially as concerns impending legislation, may be brought more effectively to the attention of all the Fellows, and, furthermore, in order that the officers of the parent society may have better opportunity to learn the views of its members, it is
>
> Moved: That the District Societies be urged to combine in groups for their Fall meetings; and that the Secretary of the Society be asked to arrange with the officers of the District Societies for these Joint Meetings on different dates.

In reply to a question from Dr. Woodward, Dr. Bowers explained that the object was to hold a meeting of each group in the fall and thus concentrate the district societies into a smaller number and get the benefit of free discussion on legislative matters at which the President might attend.

The motion was seconded and so voted.

Dr. A. H. Quessy moved that the Massachusetts Medical Society, through its Council, hereby expresses its disapproval of the Sheppard-Towner Maternity Aid bill (Senate 1039) now before the United States Senate. The bill does not entrust the proposed aid for mothers and infants to the medical profession, but to the Children's Bureau of the Department of Labor which does not possess the scientific knowledge and qualifications necessary to protect mothers and infants; he thought the bill an entering wedge for so-called "state medicine." Motion seconded. Dr. Woodward said he hoped the Council would not pass the motion. On being put to a vote, the motion was passed, the Secretary to notify the Senators from Massachusetts of the action of the Council.

Adjourned at 7.40 p.m.

Walter C. Howe,
*Secretary pro tempore.*

## APPENDIX TO THE PROCEEDINGS OF THE SOCIETY.

### APPENDIX 1.

### Report of the Committee on Medical Education and Medical Diplomas.

Your Committee on Medical Education and Medical Diplomas during the past year has been asked to pass upon the application of fourteen physicians for admission to the examination before the censors. These physicians have graduated from schools which, at the time of their graduation, were not recognized as medical schools by the Society. Of the fourteen cases considered, in twelve, the physicians were admitted to the examination and in two, the applicants were refused admission to the examination.

Your Committee considered the problems of medical education and licensure in the commonwealth with especial regard to the fitness of the various medical schools to teach medicine, and the success of the existing machinery for protecting the public from improperly trained physicians. Your Committee feels that conditions in the commonwealth in regard to these points at the present time are not satisfactory. For, at present, there are in existence in this commonwealth two medical schools which are considered, according to the classification of the American Medical Association, to be in need of a thorough reorganization before they can properly teach medicine. Also, despite the activities of the State Board of Registration in Medicine, improperly trained physicians succeed in securing a license to practice. Your Committee felt that these existing evils might be corrected by appropriate legislation and, therefore, prepared three bills for this purpose, which were presented to the 1921 Legislature.

One bill, known as House Bill No. 469, called for premedical educational requirement for admission to the examination before the State Board of Registration in Medicine. It was felt that if prospective medical students fulfilled this requirement they would then be in a position to enter schools properly qualified to teach medicine and in this way, the improperly qualified schools would either have to improve their standards to attract pupils or else go out of business. That such a bill would accomplish this purpose seems quite likely, in view of the intense opposition created in the schools which do not come up to the desired standards.

In order that the public might be protected from improperly trained physicians, two bills were introduced, House Bills Nos. 637 and 638, one requiring a year's service as an interne in a suitable hospital before admission to the examination before the State Board of Registration in Medicine, thus increasing the experience of all the doctors, and another allowing the State Board of Registration in Medicine to employ assistants in conducting their examinations, so that the tests for fitness might be more thoroughly carried out. It was felt that the first bill, No. 469, mentioned above, would help in protecting the public from poorly trained physicians in that it would cut down on the number of improperly trained applicants presenting themselves for examination before the State Board of Registration in Medicine.

These three bills had the support of the State Board of Registration in Medicine, the three medical schools standardized as Class A medical schools by the American Medical Association in this commonwealth, and the Massachusetts Homeopathic Medical Society. Of these three bills, the only one to pass the Legislature was the one allowing the State Board of Registration in Medicine to employ assistants. This bill also called for an appropriation of one thousand dollars to pay these assistants. This was stricken from the bill, but the State Board of Registration has secured it as a special grant, and it is hoped that in its appropriation in subsequent years the Board will be able to obtain sufficient appropriation in order to employ the assistants which it desires.

In the study of the situation in order to present facts for the support of these bills, it was brought out that students who enter these unrecognized medical schools find themselves in an unfortunate predicament at the end of their course, because in the large majority of states of the union it is impossible for these graduates to be admitted to the examinations of the Board of Registration in Medicine of that state. Your Committee also learned that graduates from these schools have had serious difficulty in passing the examinations of the Massachusetts State Board of Registration in Medicine, apparently because these schools are unable to give the students a proper course in medicine. The discovery of these serious obstacles for the unfortunate students trying to secure a medical education in these schools, gave an added stimulus to your Committee to attempt to secure the passage of this legislation. Your Committee feels that, although two of the bills were not passed, this year, a considerable sentiment in favor of them was created among the more intelligent legislators and that considerable information in regard to the existing conditions in this commonwealth was disseminated among the legislators and the public. It is hoped that activity will continue along these lines until the desired improvements are accomplished.

Your Committee also found that, according to the existing law, not more than three members from any state society may be on the Board of Registration in Medicine. This board is composed of seven members. Of course, it is desirable for this Board to be composed of the best physicians and naturally, the best physicians wish to join these state societies. At present, with the Massachusetts Homeopathic Society and the Eclectic Society existing in this state, it is possible to secure physicians for the State Board of Registration, but if the Eclectic Society should go out of existence, and if the Homeopathic Society should combine with the Massachusetts Medical Society, as is not at all unlikely at some future date, it might be difficult to secure a proper number of excellent men to serve on the State Board of Registration, or else it would cause a hardship to the individual by forcing him to resign from the state society. Therefore, your Committee suported a bill to change this feature of the law so that the number of members of the Board belonging to one state society was not limited. This bill, No. 465, was also defeated.

The Chairman of your Committee went as a representative of the Society to the meetings held under the auspices of the Council on Medical Education of the American Medical Association and other organizations in Chicago, in March, 1921. A separate report on the meetings will be turned in to the Council. In this report, the importance was emphasized of a proper investigation of the various medical cults and education of the physicians and public, in regard to them, so that the profession will not be criticized for being so intolerant of these cults that the public thinks the profession unjust to them. Your Committee feels that such investigations and reports would be of great value to the public and the profession and, therefore, recommends that the president appoint a committee to investigate and report to the Council on what, if any, therapeutic value there is in the various medical cults, with a view to urging the adoption of such therapeutic agents in medical practice and the education of the public in regard to them.

Channing Frothingham, *Chairman.*

## APPENDIX 2.

### Report of the Delegate of the Massachusetts Medical Society to the Annual Congress on Medical Education, Licensure, Hospitals and Public Health, Chicago, March 7 to 10, 1921.

The undersigned went as your representative to the Annual Congress on Medical Education, Licensure, Hospitals, and Public Health which was held in Chicago, on March 7 to 10, inclusive, of this year, 1921. The various organizations represented were, the Council on Medical Education and Hospitals and the Council on Health and Public Instruction of the American Medical Association, the Association of American Medical Colleges, the Federation of State Medical Boards of the United States and the American Conference on Hospital Service. The Council on Medical Education and Hospitals of the American Medical Association was formerly the Council on Medical Education, but the words "and Hospitals," were added at the Annual Meeting of the Association in New Orleans in 1920. The American Conference on Hospital Service was represented at this congress, for the first time.

The introductory remarks were made by Dr. Bevan, who called attention to the need of action on the part of the medical profession for their organization so that they can provide proper medical care for the public. He considered that these questions of the care of the public should be decided by the medical profession but felt that unless the medical profession organizes and tackles these problems the state will interfere and state medicine will be the result. He urged the medical profession to make a careful survey of the medical needs of the public in the various communities and to make plans to supply these needs. He next recommended that the medical schools in their four-year course train general practitioners, and that they should not attempt to turn out specialists in that time. He felt that the training of men in special lines should be taken up after they received their medical degree. He called attention to the fact that at the present time there was no state or other supervision over specialists, and felt that some step should be taken to make clear to the public, who really was entitled to be called a specialist in a certain field.

Dr. Leonard of Duluth, Minnesota, spoke on the practice of medicine, under the group system. He called attention to the fact that it is impossible for one man to provide the public with the various possibilities offered for the diagnosis and care of the sick. For the convenience of the patient, both in regard to time and expense, he felt that the doctors should unite in groups for diagnostic purposes. He felt that these groups need not interfere with the general practitioner nor diminish his importance, but, on the contrary, that the general practitioner should articulate with these groups as the general practitioner now does with the single specialist. By so doing, the ties between the patient and the general practitioner should be strengthened. He called attention to the importance of the members of the group not interfering with the relations between the the general practitioner and his patients.

Reports were presented by various committees representing medicine and the medical specialties, surgery and the surgical specialties, obstetrics, public health and hygiene, and preclinical subjects. These reports were prepared in order to show how much additional study should be required of a physician in order to become a specialist in the individual subject. The details of these reports will be published by the American Medical Association. In general, each committee demanded for its specialty a four-year medical course with an M.D. degree, a year, or its equivalent, in hospital service, and then a period ranging from two to three years of special study along the lines of the specialty, with due regard to the underlying fundamental sciences related to the subject. Most of the committees felt that there should be some reward for this work, such as a cerificate or a higher degree. It was emphasized that this training to become a specialist should be quite different from the existing courses offered in the various graduate schools of medcine, with the idea of giving a man an opportunity to brush up in some one subject.

In the discussion on the subject of specialists it was urged that some plan be worked out so that the public may be readily informed as to who, from his training, is entitled to be called a specialist.

President Wilbur of Leland Stanford University, called attention to the length of time necessary for a man to be prepared as a specialist and felt the time should be shortened. He claimed that two years could be readily saved in the education of American children during the grammar school period.

The second day of the conference was devoted to reports on the proper method of teaching various subjects in the medical schools. Reports were presented on the teaching of medicine and the medical specialties, surgery and the surgical specialties, and obstetrics and gynecology. These reports will be published and as they enter, with considerable detail, into the methods of teaching the various subjects, no summary will be attempted in this report

The President of the Federation of State Medical Boards called attention to the danger to public health and medical education from the referendum in the various states. Although all votes up to the present time in regard to medical problems have been favorable, the margin has been very small in several instances. To avoid legislation hostile to the public health and medical education, he considered that an active campaign for the education of the public on public health matters should be waged by the medical profession through the schools, the press, moving pictures and magazines. A definite organization, including the laity, ought to be formed for this purpose. He pointed out that the medical profession injures its case against the special cults in medicine by condemning them without giving them a chance to be heard. This attitude towards these cults arouses sympathy among legislators, so that they give their vote on the side of the cults as they look upon them as being persecuted by the organized profession.

A summary of the report of the English and French commissions, who came to this country to study medical problems and problems of licensure, was presented. It was interesting in showing the difference in methods in these countries, but offered little in the way of suggestions toward solving our problems.

Dr. H. D. Arnold presented a report from the National Board of Medical Examiners. At the present time twenty states in the United States accept the certificate from the National Board as satisfactory for admission to practice in that state. Twelve states accept the certificate with the provision that some further examination be added, and in some of the other states the certificate is used in a certain measure. This certificate is accepted for entrance into the Army Medical Service and the Navy Medical Service and the Public Health Service. It is also accepted for admission to the examination for license to practice in England and Scotland. The report went into some detail as to the requirements for admission to examination before the National Board of Medical Examiners and the character of the examination. Only graduates of Class A medical schools will be admitted. The examination in the fundamental sciences may be taken at the end of the second year and, in additon to a general written examination at the end of four years of medical study, there will be a practical examination after the student has completed a year in the hospital. The idea is to make this examination more severe than the most thorough state board examination. In this way a certificate from the National Board of Examiners, in addition to admitting a man to practice in the various states, will stand for a certain ranking in the medical profession. In order to conduct these examinations, it is going to be necessary for the National Board of Examiners to charge a fee, which will probably be $100. In the past, the fee has only been $5, because private funds have supported the Board, but in the future this will not be the case. The success of the scheme will depend upon the number of states that will eventually accept this certificate, and upon the creation in the minds of the medical profession of a sentiment in regard to the advantage of holding such a certificate as an indication of one's medical knowledge.

Mr. Whiteside, counsel for the New York State Medical Society, read a paper upon the importance of having the public take an interest in the qualifications of the physicians whom they employ He emphasized the fact that the medical profession should present to the public the facts upon which they are united and should not confuse the public on the subjects about which the profession, as a whole, is still undecided. He urged the profession through the lay press and other means, to take the initative in regard to public health matters and not to wait passively, until the public health is threatened by forces hostile to the medical profession before endeavoring to stir up sentiment in favor of measures necessary for the preservation of the public health.

The chiropractic problem in the United States was explained by Dr. Pinkham of the State Board of Medical Examiners of the State of California. The utter lack of proper medical training in this profession, the methods of advertising used, and the growth of the chiropractic schools were brought out. It is apparently, a problem of considerable importance, as is shown by the fact that in one of these schools alone there are 2000 pupils paying an annual tuition fee of $300 so that the school has an annual income of $600,000.

The American Conference on Hospital Service, which was started in 1919, hopes to include in its membership all organizations interested in hospital welfare, and, at the present time, includes in this membership fifteen different organizations. Dr. Smith, the Superintendent of the Johns Hopkins Hospital, presented a very comprehensive paper on the relation that the hospitals should bear toward the problems of public health, the care of the sick, the education of the public in health matters, the nursing problem, and toward medical education. He emphasized the importance of the hospital administrator and urged its more general recognition so as to attract the better medical men into this service. He took up teh problem of the training of nurses and the need for the development of practical nurses to care for the sick at a reasonable figure. He brought out the fact that there is not proper provision for the care of convalescent patients in our communities at the present time. His report consisted chiefly in calling attention to the needs, at the present time, rather than suggesting remedies in the hope that these needs would be taken up for consideration and remedies found.

Miss Graves, the Professor of Home Economics in New York State College, called attention to the importance of dietetics and the small start that was being made in training dietitians for posts in various hospitals. At the present time, there are very few opportunities for the proper instruction of dietitians, but the call for them in hospitals, commercial houses, etc., is becoming greater, and some provision must be made. The question comes up as to whether dietetics should be taught in medical schools or in hospitals.

The report of the Hospital Library and Service Bureau was presented. This bureau has been created in Chicago, under the auspices of the American Conference on Hospital Service, with the idea of collecting and disseminating information to any of the members of the Conference. Material is steadily being accumulated at the Bureau, which can be sent out upon request, and, if the information is not at hand, the Bureau is prepared to secure this information and send it out. The Bureau does not give opinions or advice, but simply collects information and transmits it to those desirous of it. The Hospital Conference has accepted as its standard that of the American College of Surgeons, and it is especially interested for its immediate work upon the following problems: the perfection of the follow-up system; the training of hospital executives; higher standards of community service through graduate teaching; the encouragement for demanding a hospital year as a requisite for entrance to the practice of medicine; in graduate teaching the promotion of close relation between the practitioner and the hospitals.

Dr. Vaughan, as Chairman of the Council on Health and Public Instruction, called attention to the fact that since 1900 the death rate in rural communities had not decreased and the death rate in urban communities has decreased considerably. He considers this not due so much to preventive medical measures as to the improvement in the diagnosis and treatment of sick people. He urges, therefore, that some method be taken to improve the grade of medical practice throughout the rural districts. He warned that unless this is done by the medical profession the state will take it up. This he considered undesirable. He thought that the best way to improve medical practice in the rural districts is to create county hospitals and medical centers for the use of the physicians of that neighborhood, so that they may have for their patients' benefit proper diagnostic and therapeutic aids. He urged the organization of libraries in these hospitals, for the benefit of the practitioners.

Dr. Sampson, of Iowa, demonstrated the method of county organization and county hospitals in the state of Iowa, and emphasized the fact that the greatest opposition to the development of these local health centers came from the medical profession, usually due to local jealousies. He claimed that as soon as the medical profession became united in a district and demanded proper facilities for the care of the sick in that district, it was a simple matter to persuade the public to raise money for the necessary expenses. There were several papers outlining the various methods which should be employed by the different interested elements in the community for health work. The general trend among the speakers at this congress was in favor of placing the health problems of each community in the hands of the local medical profession and opposed to having these problems settled by legislative action and state control.

It seems to your delegate that this Society should appoint a committee to study the health problems in Massachusetts, and, further, that the Society should decide whether it wants the problems settled by the activity of the medical profession or by state control. If the Society desires the former, it should take active measures to solve the problems so that the Legislature and general public will not feel called upon to do so.

Channing Frothingham.

## APPENDIX 3.

### Report of the Committee on State and National Legislation.

Your Committee in presenting their report calls attention to a condition which has never existed heretofore. The Legislature which meets next January is already chosen, and has already had one year's experience. It is a matter of record how individual members have voted on important questions. There are seven months during which the Medical Profession may lay before the members of the Legislature the causes for which we stand. If these causes could be presented with a tenth part of the zeal with which the opponents of vaccination, for example, plead for the repeal of our present inadequate laws, there is no question of our success in getting most of what we seek. It is fair to ask if any in this room without the special knowledge which we have as physicians, would do far differently from what the average member of the Legislature does. If any results are to be accomplished better than the poor results attained heretofore, it must be through the fair and reasonable presentation to the members of the Legislature, and to the public, of the causes which we believe to be right and for the general good. The opportunity to do this exists today as it has never existed before, but seven months is too short a time to allow any to be wasted.

Our successors, as members of the Joint Committee, must take the initiative and leadership, and must do the work required at hearings, but the really effective work must be done by each physician in the State, and more especially by those selected to be members of the Auxiliary Committee.

The suggestion is made that while special committees, such as that appointed to consider Maternity and Infant Welfare are not intended to deal primarily with legislation matters, the Joint Committee on Legislation will welcome any suggestions they may make, or conferences they may ask.

### Malpractice Suits.

The bill introduced by Dr. Charles E. Abbott of Andover, limiting to two years the time within which actions for malpractice may be initiated, has been enacted to take effect January 1st, 1922. It reads as follows:

"Actions of contract or tort for malpractice, error or mistake, against physicians, surgeons, dentists, hospitals and sanitaria, shall be commenced only within two years next after the cause of action occurrs."

The fairness of this provision is obvious. The witnesses for the plaintiff are always available; those for the defendant scatter far and wide.

### The Publication of a Journal by The Society.

The Committee of Nine controlling the Boston Medical and Surgical Journal, under advice of counsel, sought specific authority for the Society to undertake this. The bill which has been printed in the Proceedings of the Council for February 2, 1921, was passed by the Legislature and approved by the Governor.

### Vivisection.

The anti-vivisectionists this year again became active by introducing a bill to prohibit experiments on dogs. Leave to withdraw was granted. This bill was identical in purpose with that defeated a year ago in Congress which would have prohibited experiments on dogs in the District of Columbia. The action in this State is part of a campaign which is intended to be nation-wide.

### Vaccination.

The Medical Liberty League introduced a bill to abolish compulsory vaccination of children in the public schools by permitting any parent or guardian to prevent vaccination. This bill was passed by the Senate but was overwhelmingly defeated in the House.

A bill introduced by the presidents of the Massachusetts Medical Society and the Massachusetts Homeopathic Medical Society to extend the requirement of vaccination to private schools and to make a physician's certificate of unfitness for vaccination good for only one year was given leave to withdraw.

Since this action, the Full Bench of the Supreme Court has handed down a decision on May 28th, 1921, sustaining the Haverhill School Board in their ruling that such a certificate of unfitness for vaccination must be renewed once in two months. The Court decides that it is clearly the intention of the Legislature that the exemption shall be limited to the period when the pupil's physical condition is such that, in the opinion of the certifying physician, he is an unfit subject for vaccination. The Court further says that the Commonwealth requires general vaccination as a preventative measure against one of the most dangerous and highly contagious diseases with which mankind is afflicted.

There is every reason to believe that this most salutary decision will lead the Medical Liberty League to concentrate their energies for a repeal of the law. The issue now is more clear cut than ever. The Medical Profession must educate the Legislature to the dangers involved in allowing any class or group to grow up to become a constant menace to the public health.

### Maternity Benefits.

Senate No. 162, the Spencer bill, and House No. 1835 of 1920, the Report and bill of the Special Commission, were heard before the Committees on Public Health and Social Welfare sitting jointly. As is well known, the first of these bills is essentially a poor relief measure, while the second is proposed prenatal and postnatal nursing and in case of need, obstetric nursing.

Both bills have been referred to the next annual session. Thus the whole question is left open for continued discussion. The reference to the next session does not preclude any attempt to bring about legislation through the initiative and referendum.

Meantime the Sheppard-Towner bill is before Congress, and is endorsed by the President and by the Governors of many States.

It is earnestly hoped that this Society will take a wide and active interest in this subject, not only through the Council and through the Special Committee appointed in February, but through the various districts.

If the published mortality statistics of the State are to be credited, if the unanimous report of the special commission appointed by the Governor a year ago which includes in its membership the President of our Society and the Commissioner of Health of the State, is not wholly mistaken, the medical profession is faced with an unduly high, and in great part preventable death rate from puerperal septicaemia and eclampsia. Our State does not show as bad figures as do other States. Your Committee believes the Medical Profession should and will take the leadership in making conditions better. But we must act and act promptly and constructively to meet the conditions which confront us.

### Licensing of Hospitals.

Senate No. 250, relative to the Licensing and Establishing of Hospitals, gave the department of public welfare the right to license all hospitals, if the local board of health first certified to suitability, after holding properly advertised public hearings. The last clause of the bill reads thus:

"If, before the expiration of ten days following the last publication of the notice as required in the preceding section, the owner of any real estate within one hundred feet of the premises to be so used as a hospital notifies said department in writing that he objects to the granting of the license, no license to establish or keep said hospital shall be issued."

The wide door to blackmail under such a law is plain. So much agitation and discussion was aroused by this bill that the measure advocated by the Maternity Commission and concurred in by the Commissioners of Public Health and Public Welfare that the licensing of lying-in hospitals be transferred from the Department of Public Welfare to the Department of Public Health also went down to defeat. Certainly the licensing and regulation of all hospitals is a matter of vital concern to the entire medical profession.

### Physical Training and School Nurses.

These two measures so long fought for by various organizations and individuals have finally been enacted. Year by year supposed objections which were pointed out have been eliminated. The Physical training bill adds to the general laws governing the school curriculum, these seven words "Indoor and outdoor games and athletic exercises."

The School Nurse bill as finally enacted reads as follows:

"The school committee shall appoint one or more school physicians and nurses, shall assign them to the public schools within its jurisdiction, shall provide them with all proper facilities for the performance of their duties and shall assign one or more physicians to the examination of children who apply for health certificates required by section eighty-seven of chapter one hundred and forty-nine, but in cities where the medical inspection hereinafter prescribed is substantially provided by the Board of Health, said board shall appoint and assign the school physicians and nurses. The department may exempt towns having a valuation of less than one million dollars from so much of this section as relates to school nurses."

### Premedical Education and Licensure.

House No. 469 introduced on petition of Channing Frothingham and providing for Certain Educational Requirements of Applications for Registration in Medicine was granted leave to withdraw. It provided for graduation from a high or secondary school, and satisfactory completion of two years of college work, or the granting of a qualifying certificate by a State Board as a prerequisite to the Study of Medicine. The opposition voiced in the hearings was less this year than a year ago.

House No. 1458 introduced on petition of Dr. John J. Dowling, has been enacted. It provides that the Board of Registration in Medicine in the examination of applicants for registration as physicians and and surgeons may secure hospital and laboratory accomodations and expert assistance.

Psychiatry has been added to the list of subjects in which applicants for registration as physicians must be examined.

House No. 638 requiring a year's interneship before registration was referred to the next annual session.

Other measures intended to limit registration to citizens of the United States were defeated.

House No. 465 eliminated the clause in the law prohibiting the appointment of more than three members of any medical society to the Board of Registration in Medicine, was referred to the next annual session. With the 'Eclectic Medical Society practically extinct, the problem is becoming pressing. It would become still more pressing if a bill referred to the next annual session limiting the term of members should be favored.

Senate 369, as amended by Senate 405, relating to an investigation of the Board of Registration and other licensing boards was defeated.

House No. 467 to regulate the practice of midwifery became the basis of Senate 398. This bill was rejected in the Senate.

### Mental Examination of Indicted Persons.

A measure of importance which has been passed provides for the examination by the Department of Mental Diseases, of the mental condition of any person indicted for a capital offense or indicted more than once for the same offense. The report presented is to be evidence before the Court. This should simplify and hasten the administration of justice.

The nursing question which, a year ago, came before the Legislature in the form of a bill to license attendants has not been brought up again this year. The problem remains, however, and may next year be brought up for legislative consideration. Many organizations are considering the different phases of the matter. Individual physicians are taking an interest, but officially the Massachusetts Medical Society has done nothing in response to the action of the New England Surgical Society, taken in Providence last October. Reduced to its simplest terms, the question is, how the family of moderate means can be supplied with adequate nursing care when the need comes.

The Committee again asks for the aid, advice, and support of the whole Society.

James S. Stone, *Secretary.*

## APPENDIX 4.

### Report of the Committee on Public Health of the Massachusetts Medical Society for the Year Ending May 31, 1921.

The Public Health Committee, during the past year, has arranged, as usual, to supply on request, speakers for meetings of the District Societies. The Committee and the Society are indebted to the following named gentlemen, who placed themselves at our disposal for this purpose: Doctors Edwin H. Place, George H. Wright, William T. Sedgwick, C. Morton Smith, George Gilbert Smith, William C. Woodward, Walter E. Fernald, Frank Dunbar, Timothy Leary, Howard A. Streeter, José Penteado Bill, Lesley H. Spooner.

During last summer and autumn, the members of the Public Health Committee spent considerable time and effort in an endeavor to find something which the Committee might do in the northwestern part of the State of practical value in the promotion of public health, and which would, at the same time, reflect credit on the Massachusetts Medical Society and bring it in closer touch with people in that part of the State. A Health convocation, somewhat similar to those which have been held at Boston and Springfield, as well as various other projects, were considered.

Before the Committee could decide upon any undertaking in this part of the State, which seemed to promise pratical results commensurate with the cost, it became so late in the season that the scheme had to be abandoned for the year.

In view of the demonstrated practical value of the Schick test and the rapidly increasing demand for immunization against diphtheria, the Committee has undertaken to give physicians, in the various parts of the State, an opportunity to obtain personal instruction in making the test, in interpreting the reactions and in administering the toxin-antitoxin immunizing mixture. The Committee engaged Dr. Joseph Garland as its agent in carrying on this work. The State Department of Health has furnished the material and has otherwise coöperated with the Committee.

In the localities selected for demonstration and instruction, hospitals have, so far as possible, been used for this purpose, both on account of the convenience to local physicians and because the personnel of a hospital is likely to serve as subjects for the demonstration of the procedure.

With the resources at the disposal of the Committee, it is, of course, impossible to reach every community in the State and places where it is known that physicians are already familiar with the Schick test are being passed by. It is, as yet, too soon to appraise the results of this work, but it is apparent that the interest exhibited by physicians in the opportunity thus offered them varies greatly in different localities.

Respectfully submitted,

Enos M. Bigelow, *Chairman.*
Annie Lee Hamilton, *Secretary.*
Edward F. Cody.
Roger I. Lee.
Victor Safford.

## APPENDIX 5.

### Report of the Treasurer.

May 31, 1921.

| | |
|---|---|
| Active Account in New England Trust Co., Jan. 1, 1921 ........ | $ 2,689.98 |
| Received from all sources ...... | 34,973.24 |
| | $37,663.22 |
| Spent to date .................. | 21,158.23 |
| Balance on hand ................ | $16,504.99 |
| Balance in Old Colony Trust Co. | 3,525.52 |
| | $20,030.51 |

Arthur K. Stone, *Treasurer.*

## APPENDIX 6.

### Report of the Librarian.

May 31, 1921.

The Librarian would report that during the past year he has performed the duties of his office as prescribed by the Society by-laws.

Respectfully submitted,

Edwin N. Brigham.

## APPENDIX 7.

### Report of the Committee of Nine.

The Committee of Nine appointed by the Council at the annual meeting in June, 1920, to consider and act upon the advisability of the Massachusetts Medical Society's taking over the Boston Medical and Surgical Journal as its official organ, have attended to their duty and beg leave to submit the following report:

Pursuant to the instructions of the Council, the committee held frequent meetings to consider the problem, and at one of its meetings invited the Presidents of the District Societies to confer with them. After very full and careful consideration of the question from every angle, it was the unanimous opinion of the committee that, if satisfactory arrangements could be made with the owners, the Society should assume the responsibility of editing and publishing the Journal. The owners agreed to transfer the property, free from all incumbrances, on condition only that, in case the Society should wish at any time to discontinue the publication, the property should revert to them, equally free from all incumbrances.

The Committee, therefore, acting under the authority of the vote of the Council, have secured permission from the General Court for the Society to publish a medical journal, have taken over the property, the lease of the office, the contract with the publisher, and have appointed Dr. W. P. Bowers managing editor. The committee brought strong pressure to bear on Dr. Bowers to induce him to accept, because they believed him peculiarly fitted for the position and because they knew that he possessed to an unusual degree the confidence of the Society. That he was willing to accept, even at great personal sacrifice, is but a fresh illustration of his unselfish devotion to the interests of the Society and of the medical profession of Massachusetts.

Dr. Bowers assumed charge in April and, although progress is necessarily slow, many changes have already been made to meet what we believe to be the best interests of the Society, and further improvements may be confidently expected.

The success of the undertaking will depend on the degree of coöperation which it receives from the members of the Society. A very strong body of associate editors has been secured, whose names are a guaranty of the quality of the scientific articles which will appear, and a corps of reporters, representing the different districts, has been obtained through whom it is hoped that the activities of the local societies, as well as other matters of professional interest, may be promptly received and promptly published.

We bespeak your patience, your coöperation, and your support, and if these are freely given, we pledge our best efforts to provide you with a journal that shall be a credit to the Society.

For the Committee,
Homer Gage, *Chairman.*

May 29, 1921.

## APPENDIX 8.

### Report of Committee on Maternity and Infant Welfare.

The Committee of Seven appointed on February 2, 1921, for the purpose of studying measures for maternity and infant welfare, has held eight meetings at the Boston Medical Library.

In accordance with the vote authorizing the appointment of the Committee, it has added to its members Dr. E. P. Ruggles and Dr. O. R. Chadwell to represent the Massachusetts Homeopathic Society.

Your Committee, before presenting its formal report, desires to refer to an impression that efforts have been made to discredit the work done by the physicians of Massachusetts. This committee desires to be put on record that it holds the opinion that professional work in this state may be favorably compared with that done anywhere and, furthermore, the committee believes that Massachusetts physicians will unite and lead in finding a solution of the problem involved in the care of child-bearing women and of infants.

The Committee has unanimously adopted the following report of findings and recommendations:

*Findings:*

1. In justice to the medical profession, it should be clearly understood that so-called maternal deaths include deaths in the puerperal state which, in the international classification, includes pregnancy, parturition, and lactation. This classification is, in certain respects, misleading.

2. So far as statistics are of value, approximately 35% of 329 deaths, occurring in Massachusetts in the first half of 1920, were reported as due to septicemia and eclampsia.

3. Whether the statement that deaths from puerperal septicemia are increasing or not is correct, this Committee has not yet been able to determine, but the matter is of such importance as to demand further study.

4. Such reports as have been studied by the Committee show that deaths from toxemia of pregnancy are decreasing wherever the patients place themselves under prompt and adequate prenatal care.

5. It appears that inadequate records relating to puerperal cases are kept in many hospitals.

6. A great variation—from 3% to 18%—in the number of Caesarean sections done in hospitals of the same general type in various communities warrants investigation.

7. The time at the disposal of the Committee has not permitted investigation into maternal morbidity and infant welfare. Both of these matters warrant a study.

*Recommendations:*

1. Accurate and adequate statistics of mortality in hospital and private practice cannot be attained until physicians make more explicit returns.

2. Licensing of lying-in hospitas should be carefully supervised.

3. Publication of adequate reports by all hospitals.

4. The development of separate obstetric wards, and, where practical, of separate obstetric services in hospitals.

5. The medical profession is urgently requested to educate the community as to the necessity and value of adequate prenatal care.

6. The development of prenatal clinics in connection with existing hospitals.

7. The continuance of a committee, with an appropriation by the Society of the sum of $500 for carrying on its work, and the request that the Massachusetts Homeopathic Medical Society appropriate $50 for the same purpose, to prosecute the study of matters connected with the child-bearing state and infant welfare.

8. The various district societies are urged to appoint special committees for the intensive study of these matters, and to coöperate with any committee of the state medical societies.

Walter P. Bowers, *Chairman.*

## APPENDIX 9.

### Report of the Committee on Cancer.

*Gentlemen:*

Your Committee has the honor to make the following report:

Meetings of the Committee have been held, alone and in conjunction with the Massachusetts State Committee of the American Society for the Control of Cancer, upon which your Committee is individually and collectively represented. Three meetings of district societies have been arranged by the Secretary of your Committee during the past year, and speakers on cancer subjects have been provided. Other district societies have been approached with the suggestion of a cancer meeting during the year and, in many instances, this suggestion has been complied with and such meetings have been held.

There is a general disposition evident among members of the medical profession, as well as among laymen, to devote more attention to the educational aspects of the cancer problem, and it is the opinion of the Chairman of this Committee that for work among the members of the medical profession a committee of the Massachusetts Medical Society is the safest and most authoritative body available. On this account he recommends that the Committee be continued in office.

Respectfully,

Edward Reynolds, *Chairman*,
J. Collins Warren,
John T. Bottomley,
Edward P. Richardson, *Secretary*,
R. B. Greenough, *Vice-Chairman*.

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## MORE ABOUT THE ALLEGED SCARCITY OF COUNTRY PRACTITIONERS.

*Mr. Editor:—*

Some time ago it was stated in your columns that seventy towns in this commonwealth lacked physicians, and this deplorable state of affairs was "viewed with alarm." In order to test the truth of this statement, I wrote to one town which in its town meeting had at least discussed the matter of offering a bonus to any doctor who would settle within its limits. I asked for details as to local economic conditions and sent one letter to the town clerk and another to the proprietor of the local drug store, in both cases enclosing a stamped and addressed envelope for a reply. I have never heard from either inquiry.

Two weeks ago I inserted the following advertisement in *The Congregationalist*, which goes into nearly every town in the state big enough to support any sort of a professional man:

> Physician, A1 professional standing, educated (A.B., M.D.), Congregationalist, now city practitioner, wishes village or country practice. Protestant community, Massachusetts or Connecticut, where citizens really *want* local doctor. Good schools necessary condition, also living income from start. Strictest investigation invited. Address "Medicus," *Congregationalist*.

I really expected to possess myself thereby of a great store of information regarding the desperate medical needs of the rural districts of the state. But the fact is that up to date, two weeks after the publication of the advertisement, I have received but three replies, distributed as follows, *viz.*, one from Vermont, one from Wisconsin and one from South Dakota!

Judging from the replies received, it seems as though Horace Greeley's advice still holds good: "Young man, go west!"

Medicus.

June 14, 1921.

## THE HENRY J. BIGELOW MEDAL.

The Journal was unable to secure the address given by Dr. William J. Mayo at the time of the presentation of the Henry J. Bigelow Medal, because it had been promised to the *Journal of the American Medical Association*. It is with pleasure, however, that a reproduction of the medal is herewith presented.

HENRY JACOB BIGELOW
1818
1890
THE BOSTON SURGICAL SOCIETY FOUNDED 1914
AWARDED TO
WILLIAM J. MAYO
1921
FOR CONTRIBVTIONS TO THE ADVANCEMENT OF SVRGERY

◆

## OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY ELECTED MAY 31, 1921.

*President:* John W. Bartol, 3 Chestnut Street, Boston.
*Vice-President:* Brace W. Paddock, 7 North Street, Pittsfield.
*Secretary:* Walter L. Burrage, 42 Eliot Street, Jamaica Plain.
*Treasurer:* Arthur K. Stone, Auburn Street, Framingham Center.
*Librarian:* Edwin H. Brigham, 8 The Fenway, Boston.

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## Original Articles.

### A MECHANICAL EXPLANATION OF THE SUFFERING WHICH IS ASSOCIATED WITH PROLAPSE OF THE UTERUS.

By George M. Garland, M.D., Boston.

*Formerly Physician to the Woman's Room in the Out-Patient Department of the Massachusetts General Hospital.*

Thirty-two years ago, Dr. W. E. Boardman, who died of pneumonia recently, made the remark to me that in his experience with womb troubles, he had observed that prolapse of the uterus, irrespective of any flexions or versions present, was the chief cause of suffering in the patient. This remark agreed with my own experience. At that time, I had charge of the Woman's Room in the Out-Patient Department of the Massachusetts General Hospital, where I was having the benefit of a very large clinic, and I had, myself, made the observation that prolapse of the uterus, among so-called displacements, was the predominant cause of suffering. My interest was therefore aroused to study the reason why prolapse of the uterus should cause such distress. After a time, I accumulated a few observations, as follows:

A prolapsed uterus which is giving rise to backache and pressure, distress and abdominal pain, usually appears with an enlargement and a congested condition of the body of the womb. When this condition is severe and has been in existence for some time, the uterus becomes tender to pressure, tender to ordinary examination, and to efforts toward replacement. Under such conditions, foci of inflammation of tissues adjacent to the uterus are apt to form. These foci are sometimes very tender and may result in adhesions, which resist efforts at elevation of the uterus. This congested condition of the womb and its annexes may be easily understood if we consider the blood supply through the womb. The vessels enter on each side of the uterus through the broad ligaments, and when the uterus is forced downward in prolapse, the vessels on either side are mechanically folded together against the side of the uterus. While this folding of the vessels does not prevent the entrance of arterial blood under cardiac impulse, it does interfere with the venous escapement of the blood, and results in a passive congestion of back-water pressure. The indication for this venous obstruction is the elevation of the uterus to a point where its circulation will be normal and free once more. In my own practice of restoring a prolapsed uterus, I have never used any instruments, but, placing the patient in the knee-chest position, I have gently pushed the uterus, without force, from the pelvis toward the abdomen. If there was much tenderness present, or foci of inflammation to be felt, I employed hot-water injections to reduce the congestion and tenderness, and also used pledgets of lamb's wool saturated with glycerine. When the tenderness was sufficiently reduced, I inserted a small pessary to hold the uterus up. The large pessaries are liable to press upon neighboring parts and may cause trouble. One simply needs a small cradle, so to speak, to hold the uterus up where it belongs. Restoration of the circulation by this method is quickly followed by the disappearance of local congestion and the diminution of all subjective symptoms of pain and discomfort. The body of the uterus becomes smaller and firmer in texture; the tonicity of the ligaments attached to the uterus is restored and helps to hold the uterus in place. In the course of a few weeks of such support, the vagina, which, at the beginning, was relaxed and admitted a pessary of considerable size, shrinks in its circumference, and one is obliged to refit it with a smaller pessary. The disappearance of congestion and the cure of the subjective symptoms by restoration of free circulation, seems to be conclusive that the prolapse was productive of the venous obstruction described, and the cause of all distress.

To illustrate the mechanics of this condition in another way, I will remind you of an ovarian cyst. A small cyst may exist, so insignificant in size that it cannot be felt through the abdominal wall, and the patient may be entirely ignorant of its presence. Let that cyst be rotated half way round. There is now strangulation. The blood enters the cyst through the arteries but cannot escape freely through the veins of the twisted pedicle. A hornet's nest, stirred up with a stick, is symbolic of the peace of the simple life compared with the fury and hurricane that follows such a twist of the pedicle. Pain, suffering, interference with every function of the woman's body, quickly follow; bowels and kidney are almost put out of commission, while the tumor, or cyst, grows, and in the course of two or three weeks, may be found by the operating surgeon to weigh twenty-five or thirty pounds. It is adherent to everything near it, and its career has been a tempest of woe.

The other day, in a report of the Boston City Hospital, I noticed reference to an article by Dr. Clute, on, Torsion of the Spermatic Cord. I read the article with a great deal of interest, for it shows the association of torsion of the spermatic cord with that which I had been studying in connection with the uterus. A simple turn once around of the cord is enough to cause violent pain, swelling of the testicle, and a very severe condition of things, until an operation relieves the trouble.

On January 6, 1921, an article, by Dr. S. S. Dearborn, appeared in the Boston Medical and Surgical Journal on, "Torsion of the Fallopian Tube," which further illustrated the violent results of an obstructed venous circulation. In these cases, untwisting is impossible; the only remedy is an operation, to undo the twist and relieve the distress. In the case of the uterus, however, we are lucky in being able to relieve the situation by simple elevation of the uterus and restoration of the normal circulation.

My thesis, therefore, is as follows: Mechanical obstruction to the escape of the venous blood from the uterus and the back-water congestion produced thereby, are as destructive to the health and function of that organ, as like obstruction is destructive to the other organs mentioned above.

When a woman has received a fall or been thrown or jarred in riding over rough roads, the condition of congestion does not develop instantly; it is not like a broken bone. She may not be conscious of the prolapse of the uterus for several days, until the congested condition described above has had time to develop. The following cases will illustrate my meaning:

A large, stout woman, weighing nearly 200 pounds, wanted to shoot the chutes. She took her place on the front seat of the sled. As you know, this sled comes down the chute with great speed, strikes the surface of the water, and the front end rises up and then falls back with a blow on the water that shakes the whole building. The woman, sitting on the front seat, received the full force of this blow. In about three days, she sent for me, and I found her uterus driven down into the pelvis, and she was in great pain. I placed her in the knee-chest position and put the uterus into place. She was perfectly well afterwards.

A young woman, 18 years of age, was standing on her lawn, when a dog ran behind her and knocked her feet from under her. She sat down with considerable violence. In a short time, she began to suffer with pain and distress, and prolapse, with retroversion, was found. Her distress was relieved by lifting the uterus up, but was liable to recur at intervals. Sometimes she would pass several months in comfort; then the uterus would drop again, and pain and distress come on. Finally, she was relieved by an Alexander operation.

In 1877, a course of lectures on "The Mechanical System of Uterine Pathology" was delivered before the Harvian Society of London by Dr. Grailey Hewitt, Professor of Midwifery and Diseases of Women, University of London. The report of these lectures may be obtained at our Medical Library, for full description. Dr. Hewitt propounds the theory that the mechanical cause of the suffering in these cases is due to flexion of the uterus and nerve pressure at the seat of the flexion, which produces the pain and distress and other nervous reflexes which are associated with this group of diseases. I have not space here to properly present all his arguments; they can be found in the profusely illustrated article referred to above.

I wish, now, merely to call attention to this fact: In my cases, no attempt was ever made to change or disturb the condition of flexion which might be present. I never used any instrument to straighten out the flexion. I simply ignored it and elevated the uterus in the knee-chest position, with as little force as possible, largely depending upon gravitation to assist me. Moreover, the small pessary subsequently used to support the uterus could have no possible influence upon the flexion. The relief of subjective discomforts was always coincident with restoration of circulation as indicated by the behavior of the organs themselves. But the process of cure in these cases was also coincident with the diminution of congested enlargement, with retraction of relaxed annexes of the uterus, and with the ability of the uterus to retain its normal position and its normal circulation, unless thrown down again by some subsequent accident.

I have at present under my treatment three women, each about 80 years of age. They came to me with complaint of severe backache, inability to walk about and attend to their usual affairs. I replaced the uterus and held it at an elevation by means of the cupped pessary with a short, curved stem. This pessary, as is well known, is held in position by small elastic tubes passed through eyes in the lower end of the stem, and attached, in front and behind, to a band. These women are able to remove these instruments for purposes of cleanliness, and to replace them themselves, and when the uterus is thus held in position, they continue to perform their daily duties in comfort.

## THE NEW SARGENT BODY-TEST.

By George Van Ness Dearborn, M.D., Cambridge, Mass.,

*Boston City Hospital.*

In *School and Society* for January 29, 1921, is the preliminary account of a new, simple, and single test of an individual's general motor efficiency, conceived and developed by Dudley Allen Sargent, "dean" of American physical educators. To every physician it is bound to be not only of theoretic interest but occasionally, at least, of much practical utility. The sooner it is generally known, tried out, appreciated, and adopted in habitual use, the better for all concerned. It seems to comprise a test of much in little time, much more, indeed, than any other single test known to the present writer. Let Doctor Sargent, for forty years so well known at Harvard, tell of his dynamic device in his own words (excerpted from the seven-page article):

"In popular estimation, it takes so many inches and so many pounds and a certain size chest girth to make a man, and this estimation is borne out largely by experience. Hence, the universal interest in the physical measurements of the human body. However, those of us who are engaged in making physical measurements of men by the thousand soon learn the limitations of the information which comes to us from this source alone. While it is true that the strength and functional capacity of a part generally increases with the size of that part, other things being equal, the number of cases where other things are not equal is so numerous that the generalization should be greatly modified.

"The measurements alone do not tell us anything of the texture and quality of the parts covered, *i. e.*, how much fat or bone, and how much muscle, nor do the measurements alone give us any information of the innervation of the parts upon which power and efficiency so frequently depend. Even if we accept the physical measurements of a man as an indication of his potential power, so many of us almost intuitively do, we are soon taught by experience that *there is in many men an unknown equation which makes for power and efficiency which has never been determined and which can only be measured by an actual test.*

"The important question is, what is this unknown equation and how can it be simply and practically tested and numerically expressed? With a good many others, I have been wrestling with this problem for years by the way of strength tests, endurance tests, speed tests, etc., but have never come across any one that satisfied me or quite met the demands of the situation.

"It is said that every pioneer, or inventor, or discoverer, if he lives long enough, goes through three stages in his career. The first one is where his propositions are unfounded and absurd; the second stage is where, if proven true, they are not original; and the third stage is where they are so self-evident that any fool ought to have thought of them. I have now arrived at the third stage in my career, and want to share what seems to me the simplest and most effective of all tests of physical disability with the other fools who have been looking for one.

"I have dwelt at some length upon gravity as a constant force to be overcome and its relation to the height and weight and other measurements of the body. The new test that I offer consists of using the constant factors of height and weight which one always has with him, in a little different way than is commonly thought of. It is so simple, and yet so effective for testing the strongest man or the weakest woman or child, that one feels almost like apologizing to the general public for mentioning it.

### THE NEW TEST.

"The individual to be tested stands under a cardboard disk, or paper box cover, heavy and stiff enough to hold its form, about twelve inches in diameter, held or suspended from ten to twenty or more inches above his head. He is then requested to bend forward, flexing the trunk, knees and ankles, and then, by a powerful jump upward, straightening the legs and spine, to try to touch the cardboard disk with the top of the head. Swinging the bent arms forward and upward at the time the legs, back and neck are extended, will be found to add to the height of the jump. When the disk has been placed at the highest point above the head that can be just touched in jumping, this height is measured. The difference between this height and that of the total stature is, of course, the height actually jumped."

* * *

If, then, in the new test, we multiply the total weight by the height jumped, and divide this product by the total height of the person in inches, the result will give a fair index of the effort made in the smallest number of figures. This is always an advantage in making a test and handling the data for statistical purposes.

Thus, if the individual tested weighed 150 pounds and jumped 20 inches above his head, and was 70 inches tall, the formula for his efficiency would be as follows:

$$\text{Index} = \frac{\text{Weight x Jump}}{\text{Height or stature}} = \frac{150 \times 20}{70} = 42.8''$$

Both as a reformed physiologist and as instructor in the physiology of exercise for the last twelve years in the Harvard Summer School (as well as elsewhere), the present writer has tried his humble best to see some theoretical fault with the Sargent body-test, claiming to be so much in so little even to almost the *proba optima* of human all-round dynamism. One looking for trouble usually finds it, and I am suggesting that this index should be in metric terms rather than in the clumsy and uncouth scale of our ancestors. Furthermore, the test, fundamentally a ponderal index, puts inexpedient eugenic premium on the short, stocky and over-weighted *format* of the human volume in contrast with the "Uncle Sam" type. Undoubtedly, it is to the former shape that real, unhyphenated, *i.e.*, permanent, Americans are rapidly tending, and this test would help to show them to be apparently physically superior—which hygienically and esthetically, humanly, speaking, they are not. By this test, the young, short, thick-set athlete shows his great superiority to the tall and thin, arthritic and sclerotic person at middle age, rather more than the ideal, hygienic status would warrant. Age hath its sanitary victories no less renowned than youth. But this, of course, is not primarily a hygienic test, nor does it claim to be. Lastly, there might be a light recording pen-lever attached to the head that would be self-recording and so less crude mechanically.

Aside from these really minor, because morphologic and accidental, implications, this test, in the language of the dormitory, "looks pretty good" to me. I am, probably, even a bit chagrined that so simple and comprehensive an idea did not seep down through my own archepallium.

This "stunt" not only measures the effective power of most of the essential muscles of the body (the so-called ambulatory muscles are two-thirds of all the muscle), and the person's mental and nervous dynamism ("pep" momentarily is the academic slang), but it automatically compensates differences both in weight and in stature in a remarkably perfect, scientific way. The fat man, for example, often makes a low rating, as he deserves to make; while the "wiry" woman (wiry in the physiological rather than the psychological, sense) makes a high mark as part of her reward of merit in denying herself the forbidden fruit of the chocolate tree, etc. The child and the senescent, the tall and the short, even the cardiopath and the pneumopath (if the index be done at once, repeatedly), are tested with equal accuracy. Quite the proper penalty is imposed on chronic arthritis, sclerosis, and "muscle binding"; and on clumsiness. And the abulic, the hysteric, the neurasthenic get the rating that would seem to belong to their enforced lack of dynamic endeavor.

The end of Dudley Sargent's preliminary report reads as follows:

"I think, therefore, that the test as a whole may be considered as a momentary try-out of one's *strength, speed, energy, and dexterity combined*, which, in my opinion, furnishes a fair physical test of a man and solves in a simply way his unknown equation as determined potentially by his height and weight. It will be observed that the parts tested, namely, the muscles of the feet, calves, thighs, buttocks, back, neck, anterior deltoid, chest and biceps, are the muscles most used in all forms of athletics, sports, track and field games, setting up exercises, posture drills, etc., and are of fundamental importance in all the active industries. For this reason, I think it should precede any other all-round physical test in basic value.

"In presenting this paper for discussion, I have intentionally narrowed myself down to a consideration of the factors involved in making the test, omitting the experience that has led up to it, and the application that may be made of it, and the method of conducting it.

"To those who wish to try the experiment, I would suggest that the jump be made in gymnasium slippers or, at least, in shoes with low heels, and as the factors, weight, height and height jumped are to be multiplied and divided in the calculation, that all the measurements be made with the greatest accuracy.

"If the test is of any value, then the standardization of it, and the collection of different data concerning it will, of course, be of the greatest importance, and follow naturally for the benefit of those who want to make use of it."

Unless my cortical synapses are worse awry than usual (which Æsculapius forbid), this test of the psychophysical individual at any moment has in it the simplicity-in-completeness indicative of "inspiration." None the less, the proof of this pudding, too, is in the eating thereof, unless and until caliometric measurement of the metabolism involved shall more promptly establish its comprehensiveness, as surely it would do.

Meanwhile, I understand that the suggestor of the test is arranging to give the public, and especially the medical public, early opportunity to try it out personally and to examine the data already accumulated (in part from the Harvard faculty) in the light of several other related circumstances. The procedure is a simple one and may readily and quickly be carried out in any physician's office. "Knocks and boosts" and other contributions would help to set the actual status of this new index of personal efficiency,—that is, on an empirical instead of on a purely theoretic basis. It is hoped that many will jump at the opportunity.

# GOITRE.*

By Joseph Stanton, M.D., Boston,
*Visiting Surgeon, St. Elizabeth's Hospital.*

It is true that a goitre is any enlargement of the thyroid gland. The physiological enlargements of puberty and pregnancy are familiar to you all and are of no particular interest in this discussion, for it is with the surgical aspects of goitre that we are particularly concerned.

We may divide goitres into two classes, the simple and the toxic. The former is simply an enlargement of the gland, which may be glandular or cystic. It presents no symptoms unless large enough to produce pressure with partial or complete paralysis of the recurrent laryngeal nerve, or necrosis of the tracheal cartilages with accompanying cough or dyspnoea. Their removal is comparatively simple and the mortality is practically *nil.*

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* Read before the South Boston Medical Society at its December meeting.

The latter is a much more complicated surgical problem and embraces the so-called toxic adenomata, so clearly brought out by the studies of Dr. Plummer of the Mayo Clinic, and the so-called exophthalmic cases with which you are all familiar.

About 50% of all the cases of hyperthyroidism have exophthalmos. Of all the glands of internal secretion, if we exclude the ovary which is primarily a generative organ, the thyroid remains the most easily accessible. Its diseases have been more carefully studied, and surgical measures for their relief are better perfected than for the relief of disturbances of any of the other glands which make up the so-called endocrinous system.

Its inter-relation with the thymus, the adrenal, the ovary is presented to you in your every-day practice. The disturbances of the menopause show the close relation of the thyroid, adrenal and ovary. As the ovary becomes less active, its glandular tissues become replaced by cystic and fibrous tissues. An increase of the adipose tissue is the result when the ovary or thyroid become less active. This lack of balance of these two glands is frequently accompanied by a rise of blood pressure.

Changes in the functions of any of these organs of the body; those in the thymus accompanying disturbances in the thyroid; hence the importance of x-raying cases of goitre to eliminate the possibility of an enlarged thymus with a status lymphaticus, which has been the cause of death in certain goitre operations.

## EMBRYOLOGY.

The thyroid is developed from the ectoderm which goes to make up the tissues of the pharynx. The upper cleft divides into an anterior and posterior part: the former making up the thyroid and the latter the anterior lobe of the hypophysis or petuitary body. This development from the same portion of the embryonic structure offers an explanation of the inter-relation of the anterior lobe and the thyroid.

During the early period of embryonic development the gland descends from the pharynx and becomes located in its normal position in front of the second, third and fourth tracheal rings, developing as a central mass from which the lateral lobes develop on each side of the trachea. Occasionally as the gland descends from the pharynx, segments may become detached and later develop and give us the lingual goitres, or those little fragments of the gland which discharge colloid material through a sinus on the neck and require such extensive dissections to produce a cure.

## ETIOLOGY

This still remains obscure. The prevalence of goitres in certain sections of the world would lead one to believe that the water supply must be at least a contributing factor in producing disturbances in the structure and functions of this gland.

The marked diminution occasionally observed after the removal of infected tonsils tends to prove that focal infections have something to to with hyperthyroidism. The administration of iodine in certain cases will produce a decrease in size showing the low iodine content in some goitre patients.

The sudden enlargement sometimes noticed after a profound nervous shock shows how sensitively the sympathetic nervous system is related to this gland.

Symptoms of hyperthyroidism are self-evident in the majority of cases; the palpitation usually the first to attract the patient's attention, the tremor visible in the fingers and the tongue, the redness and perspiration on the skin, and the enlargement of the neck. This last symptom is best brought into view by extending the head and asking the patient to swallow.

The toxicity of the gland is not dependent upon the amount of the enlargement. In the exophthalmic cases, the bulging of the eyes varies according to the severity and duration of the disease. Vomiting, diarrhea and oedemia occur only in the severe cases in a critical stage, where operations of any kind are dangerous. Pruritus is occasionally very marked. I had one patient, where the itching was so intense that one would mistake it for scabies.

Basal metabolism is much increased, being sometimes A + 90. The higher the metabolism rate, the more severe the case and the greater the operative risk.

### TREATMENT.

The mild cases of toxic goitre sometimes yield to long periods of rest and simple life. Those, with well established symptoms, particularly the exophthalmic cases, are proper subjects for surgery. Any mild toxic case may become toxic years and years after the onset of the disease, and it is far better to operate early than to wait until serious organic changes have taken place in the vital organs of the body, particularly in the muscular structure of the heart.

The exophthalmic cases are much more frequent in the female than in the male, and appear most frequently at about thirty years of age.

All operative cases should be given a period of rest in bed, with ice applied to the neck and freedom from all psychic disturbance. Small doses of morphia and belladonna should be taken to slow down the metabolism. Digitalis is a useful drug to lessen the action of the heart, which is so annoying at times. The slower the heart and the lower the basal metabolism, the safer the operative risk.

If the pulse is continuously under 120 and the basal metabolism is under ± 30, it is safe to perform a radical operation. If the pulse is continuously over 120 and the basal metabolism over + 30, it is far better to do a preliminary ligation or use injections of boiling water in order to bring the patient into the zone of safety.

When one has to decide what to do in the individual case, he must use his surgical sense. The extremely toxic patient, rapidly losing weight, is a poor surgical risk. The two-stage operation has decreased the operative mortality in many other diseases, and, I am sure, will in the future lower the mortality of this disease.

The x-ray has been of doubtful value in the treatment of toxic goitre. Hydro-bromide of quinine is of little, if any, value. The improvement sometimes seen during its administration may be explained by the natural improvement evident from time to time in the course of the disease. This particular one seems to progress in cycles, similar to pernicious anaemia.

I have found injections of boiling water, as advocated by Dr. Porter of Fort Wayne, Indiana, of great value in bringing six cases of the very toxic exophthalmic type into the zone of safety, so that I was able to do a radical operation at one sitting.

The technique is very simple: freeze or cocainize the skin over either lobe, and with a hot syringe filled with boiling water, inject from 2 to 6 cc., according to the size of the gland. This destroys a certain amount of the gland and lowers the amount of toxic poured into the blood stream. Four to six injections usually suffice.

Primary ligation should be done in the extremely toxic cases under local anaesthesia, ligating one side at a time, and including nerves, blood vessels and lymphatics, as advocated by Dr. Charles Mayo. From one to six months should elapse before a resection is done, depending on the rate of improvement after the primary ligation.

By a process of slow evolution in the surgical treatment of hyperthyroidism, we have learned that the failure to cure many cases in the past was due to the removal of too little of the gland. From two-thirds to five-sixths of the gland should be removed, according to the toxicity of the case. If the greater part of both lobes is removed and a thin layer left with the posterior capsule, no damage will be done to the parathyroid, and sufficient gland will be left to maintain normal metabolism.

No isthmus should be left, for it is almost sure to develop and produce a noticeable and troublesome deformity.

### OPERATION.

The operation itself is comparatively simple. The anaesthesia varies, according to the choice of the individual surgeon. Some use ether exclusively; others, nitrous oxide, while a third group prefer local anaesthesia.

The method which I have found most satisfactory is as follows: Morphia in sufficient dosage is administered subcutaneously to produce drowsiness. It is important to begin the administration of this about three hours before the time set for the operation. I repeat the dosage quantity to produce results in the individual case.

The patient is then placed in an upright position on the operating table, and the line of incision in a wrinkle at the base of the neck is infiltrated with 1% novocaine. The skin is incised together with fat platysma and fascia. Flaps involving these structures are then turned up and down, and the sterno-hyoid and sterno-thyroid muscles and the deep fascias are exposed. The latter is incised in the median line and this, with the extrinsic muscles of the larynx, is retracted on either side. In case of large tumors these muscles have been stretched so that it is rarely necessary to cut any of the muscle fibres.

The gland is exposed and lifted from its bed and removed, leaving the posterior capsules with a thin layer of gland and the parathyroid bodies. The isthmus should always be removed for reasons already mentioned.

A small cigarette drain should always be left in to drain the blood and free thyroid material. The fascia is closed in the median line, and the skin flap with two rows of sutures, to prevent the spreading of the scar, which is hardly noticeable, if made in a wrinkle at the base of the neck, instead of over the most prominent part of the tumor. I usually use a No. 1 plain catgut subcutaneous suture, which does not have to be removed, and makes a very little scar.

In a series of 208 operations on the thyroid gland, 80% of which were for hyperthyroidism, the mortality has been a little less than 2%. Two of the fatal cases died within twelve hours of acute hyperthyroidism, while a third passed away with acute abdominal disturbance, suggestive of mesenteric thrombosis.

I think local anaesthesia, with morphine necrosis, the selection of the proper time for operation in the individual case, resorting to palliative operations or injections of boiling water in order to prepare the patient for a radical removal, and finally, the removal of sufficient gland, are the three important steps in the progress of thyroid surgery during the past decade.

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The full time health officer is an asset to the community in which he serves. On the other hand, the part time health officer is a joke, as a rule. For, though he may be trained in public health work, he cannot give efficient service on a wage that would scarcely pay his office rent. As a matter of fact, most part time health officers do give an immense amount of service far in excess of that for which they are supposed to be paid. But as their bread and butter must come from the earnings they make in their private practice, naturally, the practice is given first place. Public health work today, rightly performed, is only the intensive application of that now generally accepted doctrine. And as health is the most important thing in the world, the prevention of needless sickness and deaths naturally becomes also of first importance.

Here are some figures from the *Journal of the American Medical Association*, which show substantial balances on the credit side of the health ledgers of the cities named. These figures show the death rate per year for each 100,000 inhabitants in the twelve largest cities in the United States from typhoid fever for 1910 and 1920. Note the reductions:

| City | 1910 | 1920 |
|---|---|---|
| Pittsburgh | 65.0 | 2.7 |
| Philadelphia | 41.7 | 3.3 |
| Baltimore | 35.1 | 4.7 |
| San Francisco | 27.3 | 3.1 |
| Buffalo | 22.8 | 5.1 |
| Detroit | 21.1 | 5.1 |
| Los Angeles | 19.0 | 2.6 |
| Boston | 16.0 | 1.5 |
| Chicago | 15.8 | 1.1 |
| Cleveland | 15.7 | 3.2 |
| St. Louis | 14.7 | 2.7 |
| New York | 13.5 | 2.4 |

—*Chicago School of Sanitary Science*

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# THE A B C OF RADIUM.

By Ernest M. Deland, M.D., Boston.

[From the Colllis P. Huntington Memorial Hospital.]

## THE PHYSICS OF RADIUM.

Radium is a metal of the alkaline earth family, similar in its properties to barium. Its atomic weight is 226. The metal radium has been isolated in very minute quantities, but it has no use in therapeutics. It occurs in nature in the salts, radium sulphate, radium chloride and radium bromide, which are in combination with uranium compounds in the form of pitchblende. In 1896, it was discovered that when pitchblende was placed near photographic plates, it affected the plate in the same way that light does. Bequerel described the phenomenon, and the rays were accordingly called "Bequerel rays." Radium was discovered in uraniaum ores (pitchblende) by Monsieur and Madame Curie, in 1898. Since that time, the Curie Institute in Paris has taken an important place in radium research.

The chief deposits of uranium ores in this country are in Colorado and Utah, in the form of carnotite. Previous to 1914, large quantities of this ore were sent to Germany and there the radium was extracted. Since the beginning of the war, the methods of extraction have been perfected in this country, chiefly at Pittsburg. Formerly it was necessary to export two hundred tons of carnotite (containing 2% of uranium oxide) to obtain one gram of radium element. Lower grade ores are used now where transportation distances are shorter.

The old alchemists endeavored to effect a change from one element to another. Modern chemists ridiculed their efforts, but the whole study of radioactivity is one of changing from one element to another. These changes are automatic and go on without the aid of man. Our old definition of atom is now old-fashioned. The atom as defined today consists of a minute nucleus made up of + and — electrons and an outer system of negative electrons held in equilibrium. The electrons of the outer circle are easily altered in arrangement, but those of the nucleus cannot be changed. Certain atoms are continually exploding, resulting in a rearrangement of the electrons in the inner and outer systems. These atoms are radioactive.

In radiotherapy, we are dealing with three kinds of radiations: the alpha particle is the nucleus of a helium atom (at. wt. 4) with two + charges of electricity; beta particles are negative electrons of enormous velocity; gamma rays are similar to x-rays, but are more penetrating.

Table 1.

| Element | Radiation | ½ Value Period | Atomic Wt. |
|---|---|---|---|
| Uranium 1 | alpha | 5,500,000,000 years | 238 |
| Uranium $X_1$ | beta & gamma | 24.6 years | 234 |
| Uranium $X_2$ | beta | 1.15 minutes | 234 |
| Uranium 2 | alpha | 2,100,000 years | 234 |
| Ionium | alpha | 140,000 years | 230 |
| Radium | alpha | 1,730 years | 226 |
| Radium Emanation | alpha | 3.85 days | 222 |
| Radium A | alpha | 3 minutes | 218 |
| Radium B | beta & gamma | 26.7 minutes | 214 |
| Radium C | beta & gamma | 19.5 minutes | 214 |
| Radium $C_1$ | alpha | $\frac{1}{1{,}000{,}000}$ second | 214 |
| Radium D | beta | 15.83 years | 210 |
| Radium E | beta & gamma | 48.5 days | 210 |
| Radium F (polonium) | alpha | 136 days | 210 |
| End (radium lead) | | | 206 |

Note in Table I that radium is derived from uranium by a series of steps. Each element in the series gives off rays. Those giving off alpha rays lose 4 from their atomic weight. Four is the atomic weight of helium, of which atom the alpha particle is the nucleus. The time required for each element to lose one-half its value varies from a few seconds to many years. That of radium is 1730 years, while that of radium emanation is but 3.85 days. Radium itself changes into radium emanation and then into other elements (Radium A, B, C, etc.). The final product is radium lead, the atomic weight of which differs by a fraction of a per cent. from that of ordinary lead. It has the same chemical properties as lead and is an isotone of that metal.

There comes a time when the number of atoms of radium emanation disintegrating per second equals the number of atoms of radium changing per second,—there is then equilibrium between them. There is equilibrum between radium and its disintegration products in the deposits of carnotite ore found in nature. In the commercial applicator of radium salt, with its varnished surface, there is an equilibrium between the radium products. In these, it is not the radium or the emanation which is so radioactive, but the radium A, B and C, all solids. When radium emanation is used, we are one step nearer these elements (see table).

### RADIUM EMANATION.

Radium emanation is a gas, giving off alpha particles. The curie, the unit of measure, named from Monsieur and Madame Curie, is the amount of emanation in equilibrium with one gram of radium element,—a millicurie, with a milligram of radium. In collecting the emanation from radium bromide in solution, the gas is passed over a hot copper wire. This combines the hydrogen and oxygen in the form of water, which is absorbed by phosphorus pentoxide. The $CO_2$ present is absorbed by potassium hydroxide. The purified emanation is then pumped in a vacuum into a long capillary glass tube. This is then cut up into the desired lengths for use. The apparatus for the preparation of emanation was first devised by Dr. William Duane of the Huntington Hospital.

The emanation when collected in these tiny glass tubes, at first has very little radioactive strength. Immediately, however, Radium A, B and C are deposited on the walls of the tube and the tube becomes radioactive. After three hours, a tube can be measured. The measurement of emanation is made possible by the fact that emanation ionizes gases. If a tube is placed between two insulated metallic plates and a current applied. the flow of the current may be measured by the galvanometer. Emanation, rather than radium salt, has been used entirely at the Huntington Hospital for the past six or seven years.

### THE TECHNIQUE OF RADIUM THERAPY.

The complicated technique of radiotherapy depends on the fact that alpha beta and gamma rays vary in their penetrating powers. A thin layer of radium lying in a dish gives off 90% alpha, 5% beta, and 5% gamma particles. Alpha rays are easily absorbed and have very little penetrating power. If radium salt or the emanation is placed in a thin glass tube, practically every alpha particle is absorbed by the tube. The radiation from this tube is then about equally beta and gamma radiation. In a varnished applicator, if the varnish is very thin, there is some alpha radiation, but the alpha ray plays a very little part in radiotherapy.

Beta rays are made up of short and long rays, all of which are more penetrating than alpha rays. Glass emanation tubes laid on a surface have a very powerful effect on the surface and but little on the deeper structures. This is the type of radiation needed for a very thin, superficial epithelioma. If the glass emanation tube is placed inside of a hollow steel tube one-fourth mm. in thickness, the more caustic soft beta rays are absorbed. This is the type of tube commonly used in our applicators. Into one end of this steel jacket is screwed a cap which bears a letter stamped with a die. In the other is screwed a point. The latter is useful in inserting the steel tube into a growth or into another applicator. The letter on the cap serves to identify the tube and thus, by reference to the table of measurements for the day, to tell its strength. For vigorous radiation, as in treating an infiltrating epithelioma, this type of tube is used in direct contact with the tissues. The erythema or the slough from such a treatment takes on an oval shape because of the shape of the emanation tube. If the lesion to be treated is circular, this is a disadvantage. This difficulty is avoided by placing the tube on a round brass cone 1 cm. in height. The brass keeps the rays within the cone and the reaction on the tissue is then circular. Experiments by Dr. Bovie with photographic paper have shown that such radiation affects all parts of the area equally. However, a heavier dose is required because of the distance from the growth.

A filter of two millimeters of lead cuts off practically all the beta rays and allows only the gamma rays to pass through. Such an applicator is used for the treatment of deeper structures, where it is not desirable to cause destruction of the skin. Doses of this type are given over glands, the spleen, or deep metastases. Gamma rays are very penetrating, and closely resemble the x-rays. They are not particles of matter, as are the alpha rays, but pulsations of the ether. Gamma rays have very little effect on the skin. A filter of silver, 1 mm. in thickness, may also be used to cut off the beta radiation. This is a convenient applicator for the treatment of naevi. It is also used around the periphery of epitheliomata in what we term a "prophylactic" treatment.

Cancer tissue of the squamous-cell or glandular-cell type can be retarded in its growth by heavy doses of filtered radiation, but unless a dosage is given sufficient to destroy the whole mass and produce a slough, there is usually a recurrence. Such a destruction of a tumor mass may be accomplished by radiating with gamma rays, the filter cutting off the beta rays, or by a combination of beta and gamma radiation. Beta rays are absorbed by a comparatively thin layer of tissue, while gamma rays pass further toward the periphery. To have the same amount of gamma radiation absorbed in the thin layer of tissue, it is necessary to have many times the dosage used in beta and gamma radiation. For equal amounts of energy absorbed, the effects of beta and gamma rays are apparently the same. For the best economic use of radium or emanation, it is desirable to depend on the beta radiation to produce the most sloughing effect.

During the past few years we have used tiny glass tubes of emanations for the treatment of large growths or tumors which are inaccessible for ordinary treatments. The Huntington Hospital was the first to use this method of treatment. Tubes of from one to eight millicuries are inserted into the growths with trocars, and allowed to remain. As the emanation loses one-sixth of its strength each day, these are "dead" in a few days. They then slough out of their own accord. If they remain in the tissues, there is no harmful effect. A tube measuring one millicurie, if it stays in situ, gives a radiation totalling 132 millicurie hours before the tube becomes worthless. A two-millicurie tube gives 264 millicuries hours, and so on. The best results are obtained by using several tubes of one to two millicuries placed about 1 cm. apart. Tubes of this size are sufficient to destroy the tissue immediately adjoining, by their beta radiation. The volume of tissue actually destroyed is not proportional to the strength of the tube, the chief benefit from the larger tube being in the increased penetrating radiation, although the area of necrosis is slightly enlarged. Tubes larger than four or five millicuries cannot be used in a tumor unless drainage is instituted. Thus, in a large ulcerated cauliflower mass, where there is a means of egress for the slough, tubes as high as seven or eight millicuries may be used. In closed, encapsulated masses, large doses cannot be given without sooner or later giving a chance for drainage.

### THE NATURE OF RADIATION.

Now as to the nature of radiation. The cells of a malignant growth are embryonic. They are peculiarly affected by radiation, being from two to seven times as sensitive to radiation as normal tissues, so that they are destroyed more easily.

Microscopically, no change can be noted in epithelial cells radiated from a distance, that is, by gamma radiation. However, there is an increase in the surrounding connective tissue. This has led some writers to think that this evidence was sufficient to prove that the final effect on the epithelial cells was caused entirely by a blocking of the blood vessels, a consequent loss of nutrition to the cells, and finally, death of the cells. This theory is not generally accepted as explaining the entire phenomenon of radiation.

Probably the most generally accepted theory among biophysicists is that radiation causes an ionization of the tissues which is similar to the ionization brought about by the radiation of gases. The resulting effect on the tissues is a gradual one, the rapidity varying in direct proportion to the dosage.

This change in the tissues has been likened to the changes made in a photographic plate by light, for there, the more intense the light, the greater the effect on the silver salts of the plate. Once the exposure of the silver salt has been made, there is no further change in the plate until it is "developed," at which time the different degrees of light from the original object are brought out.

Similarly, there is a latent time after radiation until the process of "development" goes on. The exact nature of this development in the tissues, we do not know. We do know that light causes definite biochemical and physical changes in protoplasm. Bovie has shown that heat is one of the agents in bringing out the effects of radiation. He has shown that if egg albumin is exposed to the ultra-violet light at 0° C., there is no effect; but if the albumin is raised to room temperature after radiation by this light, the protoplasm coagulates.

It seems probable that the chief effect of radium is exerted on the nuclei of the cells and that the cell is most susceptible during the stage of mitosis. The theory has been advanced that the greater the proportion of nuclei to the cytoplasm, the greater the effect of radium on the cells. It is well known that the small, round-cell sarcoma, or lymphosarcoma, is very quickly effected by radiation.

The effect on a tumor when a small tube of emanation is inserted into it is quite different from treatment at a distance. At the end of ten or fourteen days, there is an area of complete necrosis surrounding the tube. Outside of this zone of necrosis, there is an area in which there is swelling of the epithelial cells, vacuolation, and oedema of the cytoplasm, and amitosis, hypochromatism and karyorrhexis of the nuclei. Accompanying this, there is capillary congestion, infiltration by lymphocytes and leucocytes, and around the periphery further infiltration by fibroblasts. All these changes occur over an area one or two centimeters in diameter. The central necrosis is the effect from beta and gamma radiation, while the peripheral changes are due to the gamma effect alone. Without doubt, some of the epithelial cells around the periphery have been damaged to such an extent that they will die; others may have been more resistant, possibly more mature, and they stop their mitoses for a time, only to continue after the effect of radiation has worn off. Indeed, clinical experience has shown that the late effect on some of these cells is one of stimulation.

It is the policy of the Huntington Hospital to treat no cases with radium which may be treated equally well, or better, with x-ray. This is due to the scarcity and high cost of radium. The Hospital has about one gram of radium element, nearly all of which is used to produce emanation tubes. Cancer of the thyroid and breast, exophthalmic goitre, enlarged thymus, and certain other conditions show as good results with x-ray. Certain of our cases are treated with a combination radium and x-ray therapy.

### THE ADVANTAGES OF RADIUM.

What, then, are the advantages of radium? (1) It has greater penetrating power, particularly the gamma rays. (2) It may be applied to smaller areas than the x-ray. (3) It is more easily applied to certain internal organs, as the bladder and uterus. (4) It is easier to transport than an x-ray machine. (5) It may be inserted inside tumors. (6) The source of the rays is much more accurately placed.

Radium emanation is used instead of the salt because of the ease with which it can be adapted to different types of applicators. The loss of a tube is a small matter, because of the low value of the emanation. However, the use of emanation requires the use of a large amount of radium (at least half a gram), an expensive plant for its production, and the employment of trained men for the upkeep of the plant.

### THE CLINICAL USE OF RADIUM.

The large majority of superficial epitheliomata are successfully treated with radium. A lesion on the forehead, neck or face may be excised, if desirable, but lesions on the eyelids, inner canthus or nose are better treated with radium, for there is less deformity. Large lesions are often excised, cauterized, and radiated afterward, if necessary. Excision of these lesions for the purpose of having a pathological examination is not important. They are the type that metastasize very late in the disease, if at all, so that the removal of glands does not have to be contemplated. Epithelomata of the ear does not respond as readily as others, partly because a smaller dose must be given. The cartilage is easily destroyed if a heavy treatment is given. This type occasionally does metastasize to the neck.

Keratoses of the face are easily destroyed by radium. Keratoses and precancerous lesions of the lips are also easily destroyed. However, it is our policy to treat with radium nothing but the earliest keratoses of the lip, except for palliation, in cases clearly inoperable. All cancers of the lip, or suspicious keratoses, should be excised by a V-shaped excision, the specimen examined, and a neck dissection done if indicated. These lesions metastasize to the neck very early, and the only safe way is to do the complete operation.

Cancer of the tongue (if inoperable), floor of the mouth, and tonsils, are treated by the insertion of emanation tubes. Relief of symptoms usually follows, and occasionally an apparent cure. However, the neck metastases, if they appear, are not easily affected by radiation. X-rays seem to have more effect than radium.

Many cases of leukoplakia are relieved by radium. These are probably treated equally well by fulguration.

In cancer of the antrum, combined operation and radium treatment is the method of choice. The radium should be applied at the time of operation, after all the gross cancer has been removed.

Cancer of the oesophagus does not do well under any form of treatment. Some cases are relieved by one or two radium treatments, but this is only temporary. In order to destroy the cancer, a treatment heavy enough to cause a severe reaction is necessary. This reaction is often serious enough to cause complete obstruction. Frequently the growth extends into the glands of the mediastinum and cannot be reached.

Radium has no value, either curative or palliative, in the treatment of cancers of the stomach or intestines.

Rectal cancer should never be treated with radium if it is operable. If inoperable, a colostomy should precede treatment. Otherwise the pain and tenesmus resulting from the necessarily heavy radiation are very severe—far worse than the discomfort of a colostomy.

Cancer of the breast, if inoperable, is best treated by x-ray. In some clinics radium is used, but a very large amount is needed to get the same results given by x-ray. Local implantations may be used to destroy some of the nodules, but this does not take care of the glands.

Cancer of the thyroid may be treated by the insertion of emanation tubes, but x-ray is probably better.

Many cases of cancer of the larynx are relieved by radium therapy, but few permanently. Combined operation and radium works well in certain cases. Necrosis of the laryngeal cartilage must be guarded against. Tracheotomy must precede treatment, otherwise the reaction may complete the obstruction.

Prostatic cancer may be treated by the insertion method through the peritoneum or by the intraurethral route. Probably the best results are by the combined operative and radium method. Results, as a rule, are not very good.

Opening of the bladder and the insertion of emanation tubes is the best way to treat vesical cancers, although they may be treated by the use of cystoscope and by applicators inserted in that way. Female bladders are more easily treated than those of the male.

Cancer of the uterine fundus is best treated by hysterectomy. If hysterestomy is contraindicated, good results are secured by intrauterine radium treatments.

In cancer of the cervix which involves the broad ligaments or encroaches on the vaginal wall and is therefore inoperable, the treatment of choice is the insertion of numerous tubes into the cervical growth, combined with steel-screened intrauterine radium treatments. Preliminary cauterization is not advisable, for the cauterization accomplishes no more than the radium, and if done at a separate sitting, it involves a loss of time. Treatment by the former method promises good results. Nearly every patient is relieved of pain, bleeding and discharge, and some are clinically cured by radium. Cancer of the vulva and vagina is treated by insertions.

Large fibroids of the uterus should be removed by operation, if operation is not contraindicated. Many smaller fibroids are relieved by intrauterine radium therapy. Relief is also given to certain obscure cases of menorrhagia.

Keloids respond readily to radiation. It has been found that they disappear more quickly if a moderately heavy treatment is given rather than a heavily screened treatment.

Cavernous naevi are easily destroyed, but port wine marks are more resistant, requiring numerous treatments. Hairy and pigmented naevi respond fairly well. Radium is to be preferred for these lesions in children, for the treatment is painless. Warts, occasionally lupus, psoriasis and lichen planus, which are resistant to other treatment, may be destroyed by radium.

Radium is now the accepted treatment of myelogenous leukemia. The white count and the large spleen are reduced by one or two treatments. The effect is only temporary, for later the spleen enlarges and the white count rises. A second series of treatments has less effect than the first, and so on, until finally the patient dies. Lymphatic leukemia may be helped for a time, but the relief is more temporary than in the other type.

Hodgkin's disease, malignant lymphoma, and lympho-sarcoma, as a rule, are easily influenced by radiation. The story is much the same as in leukemia. At first they respond quickly, but when they recur they are more resistant. When radium loses its effect, the end comes very quickly. Certain of the Hodgkin's cases belong to the so-called chronic type and live several years with an occasional treatment. Usually they die from enlargement of the abdominal, retroperitoneal or mediastinal glands.

Metastatic glands of squamous-cell cancer are not affected much by radium. A few cases have been treated by the insertion method, and the glands have become smaller. The glands do not disappear unless they are entirely destroyed, and this endangers neighboring vessels and nerves.

Sarcoma of the small-cell type responds to radium therapy better than the spindle-cell type. Combined operative and radium treatment is frequently the best. If radium is used alone, the insertion type of treatment gives the best results. Many tubes should be inserted into the periphery of the growth.

### OTHER USES OF RADIUM.

During the war, radium was used extensively in the manufacture of illuminated airplane dials, watch faces and other indicators. Minute quantities of radium, mixed with phosphorescent sulphide of zinc, caused the zinc compound to glow spontaneously in the dark. The quantity of radium used is not sufficient to give the effect alone, as only from 25 to 300 millionths of a gram are used per gram of material. The sulphide of zinc has a limited ability to cause this effect, so that, if a greater amount of radium is used, the original luminosity is greater, but the decay is more rapid.

BIBLIOGRAPHY.

Bagg: The Action of Buried Tubes of Radium Emanation upon Normal and Neoplastic Tissues. Am. Jour. Roent., November, 1920.

Boggs: The Treatment of Malignancy by Combined Methods. Am. Jour. Roent., October, 1919.

Bovie: The Action of Light on Protoplasm. Am. Jour. Tropical Diseases and Preventive Medicine, Vol. ii, No. 8, February, 1915.

Bovie, The Physiological Action of Radiation. Jour. Med. Research, Vol. xxxix, No. 2, November, 1918.

Duane: Radium in the Treatment of Cancer,—Paper before Second Pan-American Scientific Congress, December, 1915—January, 1916.

Greenough: The Treatment of Tumors by X-rays and Radium. Cinquième Congrès de la Société Internationale, July, 1920.

Janeway: The Use of Buried Emanation Tubes of Radium Emanation upon Normal and Neoplastic Tissues. Am. Jour. Roent., November, 1920.

Knox: Radiography and Radio-Therapeutics, Vol. ii.

Schmitz: The Biological Reaction of Carcinoma Cells Produced by Radium Rays. Am. Jour. Roent., vii, January, 1920.

Soddy: Radiotherapy.

Soiland: Radium vs. Radium Emanation. Am. Jour. Roent., December, 1920.

Sonnenscheim: Radium in the Treatment of Malignant Tumors of the Nose. Jour. A. M. A., Vol. lxxv, No. 13.

Viol: There is no Radium Shortage. Radium, April, 1919.

## The Massachusetts Medical Society

### PROCEEDINGS OF THE SOCIETY.

*First Day, May 31, 1921.*

THE usual clinics and the sessions of the Sections were omitted owing to the meeting of the American Medical Association in Boston, June 6 to 10, this year. The exercises of the anniversary began with the annual meeting of the Supervising Censors in John Ware Hall, Boston Medical Library, at 4.30 P.M., when Dr. Walter C. Howe acted as secretary *pro tempore,* and the usual business was transacted. The Council meeting followed at 5.00 P.M. (See Proceedings of the Council.) In the evening the Shattuck Lecture was delivered in John Ware Hall, by Dr. Haven Emerson of New York. Subject: "The Prevention of Heart Disease, A New Practical Problem." After the lecture there were light refreshments in the Supper Room.

*Second Day, June 1, 1921.*

The Society met at the Copley-Plaza Hotel at 9.30 A.M., for the exercises of the one hundred and fortieth anniversary, 130 fellows and guests being present during the morning. The President, Dr. Alfred Worcester, was in the chair. In the absence of the Secretary, Dr. Walter C. Howe was elected secretary *pro tempore.* The reading of the record of the last meeting was omitted by vote and the record as printed and distributed in the BOSTON MEDICAL AND SURGICAL JOURNAL, the official organ of the Society, was adopted. The Secretary read the following statement as to membership for the Society year closing June 1, 1921: Deaths, 54; resignations, 41; deprivations of the privileges of fellowship, 14, making a total loss of 109. There were restored by the Council, 6 fellows and admitted by the Censors, 224, making a total gain of 230, and a net gain for the year of 111. Adding this to the total of last year, 3822, the total membership on June 1, 1921, was 3933.

The following proposed amendment to the By-Laws, approved by the Council, February 2, 1921, was considered:

That Chapter IV, Section 3, of the By-Laws be so amended that the last sentence of paragraph one shall read: "Councilors only, shall be eligible to the offices above named," *viz.,* president, vice-president, secretary, treasurer and librarian, thus conforming the By-Laws to the Statutes, 1803, Chapter 85, Section 3. Digest, Article V, paragraph 3, which provides that the Councilors shall "appoint, from among themselves, a president, and such other officers of the said corporation as are to be so appointed."

The Chair having some doubt as to the advisability of passing this amendment, it was referred by vote to a committee consisting of Dr. W. P. Bowers, Dr. G. O. Ward and Dr. A. K. Stone. This committee reported that the personnel of the Council was defined by Chapter IV, Section 1, of the By-Laws. This section provides that the Council shall consist of Councilors chosen by the district societies, the officers of the parent society, the ex-presidents, the vice-presidents *ex officiis,* and the chairman of each standing committee, the last being elected by the Council itself; that when a man once became a member of that body, even though a member *ex-officio,* he was in good standing and therefore eligible to reëlection to office, until removed by the Socity, by resignation or by death. The Chair, not agreeing to this interpretation, it was moved, seconded and voted that this proposed amendment to the By-Laws be laid over until the next annual meeting.

The following proposed amendments to the By-Laws that had received the approval of the Council, February 2, 1921, were put to a vote and adopted unanimously:

Chapter I, Section 2 of the By-Laws: After the words, "fiscal year," line two, insert in parenthesis marks "except as hereafter provided in Section 6 of this chapter"; also Chapter I, Section 6. The last sentence of paragraph one shall read: "The assessment paid by fellows who are admitted to the society following the November examinations, shall be that fixed for the next succeeding fiscal year, and shall cover the dues both for the current year and for the next fiscal year."

The question of continuing the practice of sending delegates to the annual meetings of neighboring state medical societies was raised by the chair and discussed by Dr. E. A. Codman, Dr. S. B. Woodward and Dr. C. E. Abbott. No action was taken.

Dr. A. P. Merrill, referring to the vote of the Council on the previous day (May 31) asking the Secretary of the Society to arrange with the officers of the district medical societies throughout the state for a series of six joint meetings next fall, said that it had been suggested that such meetings could be more advantageously arranged by a committee made up of members from different parts of the state, therefore he *Moved,* That a committee of three be appointed by the chair to have charge of the arrangements for the proposed group meetings of the district medical societies in the fall of the year 1921. The motion being duly seconded, was so voted. In accordance with the vote, the President appointed as this committee: Dr. W. P. Bowers, Clinton; Dr. F. E. Jones, Quincy; Dr. A. P. Merrill, Pittsfield.

Papers were read according to this program:

1. "Maternity Aid and Infant Welfare,"
   Dr. Walter P. Bowers, Clinton.
2. "Legislative Aspects of Vaccination."
   Dr. Samuel B. Woodward, Worcester.
3. "Physical Education of Children and Physical Training in the Public Schools."
   Dr. Joel E. Goldthwait, Boston.
4. "Premedical Education."
   Dr. David L. Edsall, Cambridge.

At twelve o'clock, noon, the Annual Discourse was delivered by Dr. F. W. Anthony of Haverhill. Subject: "Some of the Mutual Relations Between the Physician and the Commonwealth."

The annual dinner was served in the Ball Room at the close of the oration, to 164 fellows and guests. The President said grace, in the absence of the Rev. George A. Gordon, who had been delayed, and introduced the following speakers: His Excellency Channing H. Cox, Governor of Massachusetts; His Honor Andrew J. Peters, Mayor of Boston; Roscoe Pound, dean of the Faculty of Law, Harvard University, the Rev. George A. Gordon, pastor of the New Old South Church, Boston, Dr. Hubert Work, president-elect of the American Medical Association, and Dr. John W. Bartol, president-elect of the Massachusetts Medical Society.

Adjourned at 4 p.m.

Walter C. Howe,
*Secretary pro tempore.*

Admissions Reported from June 9, 1920, to June 1, 1922.

| Year of Admission. | Name. | Residence. | Medical College. |
|---|---|---|---|
| 1920 | Adams, Donald Stansbury | Worcester | 35 |
| 1921 | Adams, William Bradford | Springfield | 11 |
| 1921 | Adler, Stuart Welsh | Boston | 11 |
| 1921 | Alden, Augustus Elihu | North Billerica | 24 |
| 1920 | Allen, Harold Musgrave | Lawrence | 12 |
| 1920 | Atwood, Warren Gerald | Boston | 11 |
| 1921 | Bacon, Joseph Ambrose Patrick | Lawrence | 34 |
| 1921 | Barach, Alvan Leroy | Boston | 17 |
| 1920 | Barrett, Charles George | Worcester | 22 |
| 1920 | Barrow, Allen Rogers | Newtonville | 12 |
| 1921 | Bazin, Edmond Albert | Haverhill | 25 |
| 1921 | Bean, Harold Cotton | Belmont | 11 |
| 1920 | Begg, Alexander Swanson | Jamaica Plain | 15 |
| 1921 | Bell, James Francis, Jr. | Boston | 28 |
| 1921 | Benoit, Samuel Joseph | Gardner | 34 |
| 1920 | Benson, Clarence Kirk | Brighton | 12 |
| 1921 | Berman, Saul | Boston | 11 |
| 1920 | Betteridge, Laurence Augustine | Boston | 12 |
| 1921 | Bishop, William Atkins | Boston | 12 |
| 1920 | Blood, Guy Frank | Roslindale | 10 |
| 1921 | Bloombergh, Horace Deschamps | Chestnut Hill | 6 |
| 1921 | Bonner, Clarence Alden | Worcester | 22 |
| 1921 | Brennan, John Patrick | North Adams | 20 |
| 1921 | Brittingham, Harold Nixon | Boston | 11 |
| 1920 | Brodrick, Francis Sidney | Boston | 44 |
| 1920 | Browder, Newton Clarence | Hathorne | 11 |
| 1920 | Bullard, Carleton Wheeler | Newburyport | 11 |
| 1920 | Burnett, Nathan Lowe | Cambridge | 45 |
| 1921 | Burns, John Edward | Boston | 12 |
| 1921 | Burwell, Charles Sidney, Jr. | Boston | 11 |
| 1920 | Byrnes, John Peter | Springfield | 48 |
| 1920 | Cahill, Henry Philip | Boston | 11 |
| 1921 | Campbell, Charles Macfie | Cambridge | 43 |
| 1920 | Carr, Earl Burton | Melrose | 16 |
| 1921 | Carr, George Byron | Lynn | 10 |
| 1920 | Cassidy, Franklin Chester | Medford | 12 |
| 1921 | Chaffin, George Lawrence | Boston | 11 |
| 1921 | Cheley, Glen Evan | Boston | 11 |
| 1920 | Cheney, Robert Cartwright | Boston | 11 |
| 1920 | Churchill, Edward Delos | Boston | 11 |
| 1920 | Clark, Cecil Whitehouse | Newtonville | 10 |
| 1920 | Cliff, Frederica Leigh | Boston | 10 |
| 1921 | Colburn, Frederick Wilkinson | Boston | 10 |
| 1920 | Cooper, Alden Vernon | Lynn | 22 |
| 1920 | Cooper, Olive Alfreda | Boston | 12 |
| 1921 | Corea, George Thomas | Provincetown | 12 |
| 1920 | Cote, Corinne Rhea | Worcester | 12 |
| 1920 | Crane, George Edward | Haverhill | 25 |
| 1920 | Crothers, Bronson | Boston | 11 |
| 1920 | Cruff, Frederick Ellery | Boston | 11 |
| 1921 | Cruikshank, Frank Sheppard | Dorchester | 12 |
| 1920 | Cunning, Daniel Sylvester | Dorchester | 48 |
| 1920 | Cunningham, Richard Augustine | Roslindale | 12 |
| 1920 | Cunningham, Thomas Donald | Boston | 11 |
| 1921 | Curran, Arthur Manning | North Adams | 20 |
| 1921 | Curran, William Louis | North Adams | 30 |
| 1920 | Curtis, Robert Dudley | Boston | 11 |
| 1921 | Dahlen, Carl Albert | Boston | 12 |
| 1920 | Daniels, Louis, Riley | Watertown | 10 |
| 1921 | Davis, William Lincoln | Boston | 11 |
| 1920 | DeCesare, Nicandro Francis | Lawrence | 12 |
| 1920 | Desmond, Margaret Ellen | Boston | 12 |
| 1920 | Diehl, Harold Edgar | Quincy | 10 |
| 1921 | Douglass, Edmund Stowe | South Barre | 22 |
| 1920 | Doyle, John Henry | Fall River | 32 |
| 1920 | Dubins, Joseph Arthur | Salem | 12 |
| 1921 | Dudley, Oscar Albert | Fitchburg | 25 |
| 1920 | Dunn, John Henry | Rockland | 12 |
| 1920 | Duval, Leon Emile | East Gardner | 22 |
| 1921 | Eaton, Charles Alexander | Boston | 10 |
| 1921 | Edgelow, Arthur Ford Geddes | Boston | 11 |
| 1920 | Edmunds, Fred Andrew | Shelburne Falls | 8 |

| Year of Admission. | Name. | Residence. | Medical College. |
|---|---|---|---|
| 1920 | Eliot, Martha May | Boston | 6 |
| 1920 | Emery, Edward Stanley, Jr. | Boston | 11 |
| 1921 | Fawcett, Deborah | Newton | 10 |
| 1920 | Fitts, Henry Bird | Southbridge | 35 |
| 1920 | Fitzgerald, Edmund Boyd | Quincy | 11 |
| 1921 | Frank, John Raymond | Boston | 23 |
| 1920 | Fremont-Smith, Maurice | Boston | 11 |
| 1920 | French, Leland Malcom | Worcester | 12 |
| 1920 | Fried, Anton Ranseen | Newtonville | 18 |
| 1921 | Gallagher, James Francis | Waltham | 12 |
| 1921 | Gilchrist, Bernard Francis | Springfield | 41 |
| 1920 | Gleason, Mardis Edward | Newtonville | 22 |
| 1921 | Glover, Donald Mitchell | Boston | 11 |
| 1920 | Golden, Ross | Boston | 11 |
| 1921 | Gorin, Nathan | Roxbury | 10 |
| 1921 | Grabfield, Gustave Philip | Boston | 11 |
| 1920 | Gurjian, Leon Kevork | Lynn | 12 |
| 1921 | Hagler, Frederic | Springfield | 3 |
| 1920 | Haines, Samuel Faitoute | Boston | 11 |
| 1921 | Ham, William Addison | Dorchester | 10 |
| 1920 | Hammond, Harry Weymouth | West Newton | 12 |
| 1920 | Harvey, John Woods | Lynn | 10 |
| 1920 | Hatt, Ednah Swasey | Newton | 12 |
| 1921 | Hayes, David Patrick | Boston | 10 |
| 1920 | Henson, Paul Palmer | South Yarmouth | 12 |
| 1920 | Hines, Clarence Reynolds | Amesbury | 10 |
| 1921 | Hodgson, John Sprague | West Roxbury | 11 |
| 1920 | Hoey, Warren Henry | Newton Upper Falls | 11 |
| 1920 | Hogan, Daniel John | Charlestown | 12 |
| 1921 | Holland, John Alexander | So. Ashburnham | 21 |
| 1921 | Holland, William Joseph | Malden | 4 |
| 1921 | Hollister, Frederick Martin | Brockton | 22 |
| 1921 | Hopkins, Frederick Sherman | Springfield | 11 |
| 1920 | Hosmer, Merrill Fowler | Springfield | 7 |
| 1920 | Hughes, Frank | Dorchester | 12 |
| 1921 | Hussey, Earle Edward | Fall River | 11 |
| 1921 | Iovanna, Nicholas | Boston | 12 |
| 1921 | Israelian, Agnes Grace | Boston | 12 |
| 1920 | Jackson, Howard Burr | Jamaica Plain | 11 |
| 1920 | Jankelson, Isaac Rudolph | Roxbury | 12 |
| 1920 | Jellis, Walter | Somerville | 12 |
| 1921 | Jennings, John Greenwood | Waltham | 12 |
| 1920 | Johnson, Elmon Reuben | Wollaston | 10 |
| 1920 | Jones, Basil Bradbury | Boston | 41 |
| 1921 | Jones, Chester Morse | Boston | 11 |
| 1921 | Jordan, Frank Herbert | New Bedford | 5 |
| 1920 | Kassees, Saad Hanna Allah | Lowell | 12 |
| 1921 | Kelley, Edward Paul | Woburn | 25 |
| 1920 | Kelly, Otis Francis | Hathorne | 11 |
| 1920 | Kenney, Thomas Hopper | Northampton | 26 |
| 1921 | Kershaw, George Henry | Fall River | 20 |
| 1921 | King, Donald Storrs | Brookline | 11 |
| 1920 | Kitsis, Henry Hyman | Boston | 11 |
| 1921 | Koppel, William | Boston | 12 |
| 1920 | Kotler, Moses George | Brockton | 12 |
| 1921 | Lacey, Henry Orlando | Somerville | 12 |
| 1921 | Larsson, Johan Gustave | Boston | 9 |
| 1920 | Laserte, Charles John | Leominster | 32 |
| 1920 | Lavelle, Gertrude Helen | Worcester | 12 |
| 1920 | Leverone, Louise May | Boston | 25 |
| 1921 | Livingston, William Kenneth | Boston | 11 |
| 1921 | Looney, Joseph Michael | Somerville | 11 |
| 1920 | Loring, Benjamin Tappan | Watertown | 10 |
| 1920 | Lucy, John Joseph | Boston | 11 |
| 1920 | Lund, Charles Carroll | Boston | 11 |
| 1920 | Lyon, Walter Sidney | Fall River | 22 |
| 1920 | Mace, Roswell Greenwood | Springfield | 12 |
| 1921 | Marvin, Harold Myers | Boston | 11 |
| 1920 | Mason, William | Fall River | 11 |
| 1921 | Maynard, Herbert Ernest | Boston | 10 |
| 1921 | McAuslan, James Lewis | North Grafton | 11 |
| 1920 | McDonald, John Francis | Lynn | 22 |
| 1921 | McKee, George | Brighton | 25 |
| 1920 | McKittrick, Leland Sterling | Boston | 11 |
| 1921 | McLeod, Melvin Saunders | Melrose | 22 |
| 1920 | Melick, Joel Miller | Worcester | 21 |
| 1920 | Menard, Leon Joseph | Fall River | 22 |
| 1920 | Merrill, Ralph Edward | Boston | 11 |
| 1920 | Mills, Chester Rudolph | Boston | 11 |
| 1920 | Monroe, Noel Gates | Southbridge | 11 |
| 1921 | Morse, Frederick Otis | Newburyport | 12 |
| 1920 | Mullen, Walter John | Springfield | 12 |
| 1920 | Murphy, Albert Barnard | Boston | 12 |
| 1920 | Murphy, John Michael | Florence | 12 |
| 1920 | Murphy, Joseph William Partick | Peabody | 12 |
| 1920 | Nicholson, Minnie James Cantelo | Haverhill | 25 |
| 1920 | Nicholson, Minnie James Cantelo | Haverhill | 25 |
| 1920 | Norman, Samuel | Malden | 10 |
| 1921 | Norton, Thomas Joseph | Pittsfield | 20 |
| 1921 | Nye, Robert Nason | Boston | 11 |
| 1921 | Ohler, William Richard | Boston | 11 |
| 1920 | O'Meara, John William | Worcester | 11 |
| 1921 | Paine, Mortimer Harwood | Maynard | 12 |
| 1920 | Pelletier, William Joseph | Brighton | 12 |
| 1920 | Persons, Carl Clough | New Bedford | 11 |
| 1920 | Phillips, Frank Elmer | North Chelmsford | 7 |
| 1920 | Phillips, Karl Tristram | Worcester | 12 |
| 1920 | Polak, Isaac Benjamin | Springfield | 12 |
| 1921 | Quinby, Robert Stanley | Watertown | 12 |
| 1920 | Raleigh, Walter Melvin | Springfield | 12 |
| 1921 | Randall, Francis Drew | Malden | 22 |
| 1920 | Randall, Guy Charles | Lowell | 12 |
| 1921 | Raymond, Albert Orville | Worcester | 12 |
| 1921 | Remich, Sumner Haven | New Bedford | 12 |
| 1921 | Risley, John Norman | New Bedford | 19 |
| 1920 | Roberts, Harry Lewis | Springfield | 12 |
| 1921 | Roberts, Oscar Brown | Baldwinsville | 36 |
| 1920 | Rowland, William Denton | Lynn | 46 |
| 1920 | Saeger, Ernest Tirrill | Boston | 11 |
| 1920 | Sanders, Morris Blackman | Boston | 11 |
| 1920 | Saunders, Sallie Harding | Hopedale | 12 |
| 1920 | Scholz, Samuel Benjamin, Jr. | Springfield | 13 |
| 1921 | Schunk, Clara Margaret | Melrose | 40 |
| 1920 | Seaman, James Alpheus | Springfield | 17 |
| 1920 | Segal, Samuel, Jr. | Springfield, | 12 |
| 1920 | Senecal, Raymond Ernest | New Bedford | 10 |
| 1921 | Shaughnessy, Michael James | Framingham | 11 |
| 1920 | Shaw, Frederick King | Concord | 11 |
| 1920 | Shedden, William Martindale | West Newton | 11 |
| 1920 | Shirley, John Newton | Watertown | 11 |
| 1920 | Silverman (now Sills), William Yale | Boston | 12 |
| 1921 | Simons, Sigmund | Boston | 12 |
| 1921 | Simpson, Charles Moffett | Boston | 11 |
| 1920 | Siragusa, James Joseph | Brighton | 30 |
| 1920 | Sisco, Dwight Lewis | Boston | 11 |
| 1920 | Slater, Robert | Boston | 12 |
| 1920 | Smith, Curtis Everett | Boston | 11 |
| 1920 | Smith, Lawrence Weld | Brookline | 11 |
| 1920 | Stamas, Theodore Albert | Lowell | 12 |
| 1920 | Stein, Louis Charles | Boston | 11 |
| 1920 | Stillman, Raymond Durgin | Worcester | 11 |
| 1921 | Swift, Robert | Roslindale | 11 |
| 1921 | Tierney, Thomas Francis | Hudson | 32 |
| 1920 | Vartanian, Mardiros Bedros | Lawrence | 47 |
| 1921 | Vose, Samuel Norton | Boston | 10 |
| 1921 | Walker, Lewis Marshall | Boston | 11 |
| 1920 | Walsh, James Henry | Fall River | 7 |
| 1920 | Wein, Barnet Maurice | Roxbury | 10 |
| 1920 | Weinberg, Philip Bacon | Brockton | 12 |
| 1921 | Weissman, Ruth | Boston | 12 |
| 1920 | Welles, Edward Sawtelle | Boston | 11 |
| 1920 | Wentworth, Lowell Franklin | Melrose | 14 |
| 1920 | West, Gustav Frederick | Roxbury | 12 |
| 1921 | Wickham, George Smallwood | Lee | 11 |
| 1920 | Wilcox, John Maxon | Woburn | 10 |
| 1921 | Williams, Carl Alonzo | Worcester | 21 |
| 1920 | Williams, Charles Amory | Brookline | 11 |
| 1921 | Wilson, Philip Duncan | Boston | 11 |
| 1921 | Winestine, Frederica | Worcester | 42 |
| 1921 | Witte, Max Ernest, Jr. | Boston | 18 |
| 1920 | Woo, Shutai Tinwang | Boston | 11 |
| 1921 | Wood, Russell | Boston | 11 |
| 1921 | Yorshis, Philip | Cambridge | 12 |

Total admissions, 224.

### Key to Medical Colleges.

3 Washington University Medical School, St. Louis.
4 Georgetown University School of Medicine.
5 Bowdoin Medical School.
6 Johns Hopkins University, Medical Department.
7 College of Physicians and Surgeons, Baltimore.
8 Baltimore Medical College.
9 Long Island College Hospital, Brooklyn.
10 Boston University School of Medicine.
11 Medical School of Harvard University.
12 Tufts College Medical School.
13 University of Colorado, School of Medicine.
14 Dartmouth Medical School.
15 Drake University College of Medicine, Iowa.
16 George Washington University Medical School, Washington, D. C.
17 Columbia University College of Physicians and Surgeons.
18 State University of Iowa, College of Homeopathic Medicine.
19 University of Pennsylvania, Department of Medicine.
20 Jefferson Medical College.
21 Hahnemann Medical College of Philadelphia.
22 University of Vermont, College of Medicine.
23 Indiana University, School of Medicine.
24 McGill University, Faculty of Medicine, Montreal.
25 College of Physicians and Surgeons, Boston. (Action of Com'tee on Med. Educa. and Med. Dips.)
26 University of the South, Medical Department, Tennessee.
28 University of Oregon, Medical School.
30 University and Bellevue Hospital Medical College.
32 University of Maryland, School of Medicine.
34 Baltimore University, School of Medicine.
35 University of Virginia, Department of Medicine.
36 Medico-Chirurgical College of Philadelphia.
40 College of Physicians and Surgeons, Chicago, Ill.
41 Medical College of Virginia, Richmond.
42 Cornell University Medical College, New York.
43 University of Edinburgh, Scotland.
44 Detroit College of Medicine and Surgery.
45 Queen's University, Faculty of Medicine, Kingston, Canada.
46 University of Michigan, Momeopathic Medical School.
47 University of Illinois, College of Medicene.
48 Albany Medical College.

### Deaths Reported from June 8, 1920, to June 1, 1921.

| Admitted. | Name. | Place of Death. | Date of Death. | Age. |
|---|---|---|---|---|
| 1884 | Allen, Bradford | Nashua, N. H. | May 2, 1921 | 48 |
| 1915 | Andrews, Oren | Gardner | April 2, 1921 | 56 |
| 1871 | †Barton, Chester Manley | Mitteneague | Oct. 1, 1920 | 82 |
| 1899 | Beckley, Chester Charles | Clinton | Feb. 4, 1921 | 45 |
| 1889 | Bernard, Barnard Lecherzack | South Boston | Oct. 28, 1920 | 57 |
| 1901 | Blake, Le Grande | Riverside, R. I. | April 22, 1921 | 67 |
| 1882 | Blanchard, Benjamin Seaver | Brookline | Jan. 14, 1921 | 64 |
| 1868 | †Boardman, William Elbridge | Boston | Jan. 11, 1921 | 76 |
| 1903 | Brady, James Francis | West Newton | May 2, 1921 | 48 |
| 1890 | Brooks, William Allen | Brookline | May 20, 1921 | 56 |
| 1893 | Brown, Frank Byron | Dorchester | July 1, 1920 | 56 |
| 1901 | Bushnell, Edward Henry | Roxbury | Jan. 23, 1921 | 55 |
| 1855 | †Chase, Irah Eaton | Haverhill | Sept. 24, 1919 | 88 |
| 1917 | Chisholm, Lawrence Chesley | Boston | April 2, 1921 | 29 |
| 1895 | Conroy, Peter John | Randolph, N. H. | Nov. 27, 1920 | 65 |
| 1904 | Crocker, Louis Allen | Brewster, | Jan. 8, 1921 | 57 |
| 1880 | Davis, Samuel Thomas | Vineyard Haven | April 18, 1919 | 62 |
| 1887 | Deane, Wallace Harlow | Springfield | April 10, 1920 | 67 |
| 1906 | Dutton, Julius Maltby | Westfield | Jan. 29, 1921 | 43 |
| 1884 | Eames, George Franklin | Scarboro Beach, Me. | Sept. 5, 1920 | 66 |
| 1892 | †Faxon, Eudora Meade | Arlington Heights | Feb. 10, 1921 | 78 |
| 1895 | Grant, James Henry | Lynn | Dec. 28, 1920 | 70 |
| 1885 | Hahn, Albert Johann | Sharon, Vt. | Aug. 1, 1920 | 67 |
| 1870 | Hayes, Stephen William | New Bedford | Nov. 2, 1920 | 72 |
| 1882 | Howard, Amasa | Chelmsford | March 3, 1921 | 63 |
| 1896 | Hughes, Laura Ann Cleophas | Roxbury | July 30, 1920 | 59 |
| 1901 | Johnson, Walter Sydney | Los Angeles, Calif. | Sept. 17, 1920 | 49 |
| 1889 | Kean, Michael Edward | Manchester, N. H. | Sept. 22, 1920 | 57 |
| 1920 | Macdougall, Duncan | Haverhill | Oct. 15, 1920 | 54 |
| 1870 | †Marble, John Oliver | Worcester | Dec. 9, 1920 | 81 |
| 1876 | †Mather, Edward Elias | Williamstown | May 22, 1921 | 77 |
| 1886 | McCarthy, Charles Daniel | Malden | June 22, 1920 | 59 |
| 1897 | McCarthy, Charles Florence | Winchester | May 19, 1921 | 51 |
| 1883 | Messer, Charles Carson | Turners Falls | May 20, 1920 | 66 |
| 1893 | Milot, Alphonse Francois | Taunton | Nov. 6, 1920 | 58 |
| 1891 | Miner, Worthington Warner | Ware | Dec. 19, 1920 | 73 |
| 1885 | Morgan, John | Hadlyme, Conn | Aug. 28, 1920 | 75 |
| 1878 | †Morong, Arthur Bennett | Boston | May 3, 1921 | 71 |
| 1889 | Morris, John Gavin | South Boston | April 14, 1921 | 65 |
| 1895 | Peck, Ablert Fred | Spencer | March 31, 1921 | 58 |
| 1897 | Plummer, Frank Joseph | Roxbury | Dec. 2, 1920 | 64 |
| 1872 | †Quint, Norman Perkins | Boston | July 27, 1920 | 73 |
| 1880 | Robbins, Elliott Daniel | Boston | Dec. 13, 1920 | 64 |
| 1892 | Ruppel, Emil Carl Fraser | Lynn | Oct. 10, 1920 | 61 |
| 1885. | Schofield, Walter W | Dalton | July 6, 1920 | 66 |
| 1897 | Sears, Harry Edward | Beverly | Oct. 20, 1920 | 50 |
| 1919 | Settle, Howard Edwin | Boston | Dec. 20, 1920 | 29 |
| 1885 | Smith, Hiram Fred Markley | Orange | Oct. 10, 1918 | 59 |
| 1879 | Squier, Angelo Orin | Springfield | Nov. 25 1920 | 66 |
| 1869 | Stevens, Andrew Jackson | Malden | Feb. 23, 1921 | 74 |

| Admitted. | Name. | Place of Death. | Date of Death. | Age. |
|---|---|---|---|---|
| 1883 | Sullivan, James Edmund | Providence, R. I. | Oct. 8, 1920 | 63 |
| 1911 | Thomas, Charles Holt | Cambridge | Sept. 4, 1920 | 70 |
| 1899 | Thorn, Edwin Cyrus | Deerfield | Nov. 12, 1920 | 45 |
| 1874 | Whitney, Willliam Fiske | Boston | March 4, 1921 | 70 |

Total, 54 Deaths

† Retired Fellow.

## OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY ELECTED MAY 31, 1921.

*President:* John W. Bartol, 3 Chestnut Street, Boston.
*Vice-President:* Brace W. Paddock,
7 North Street, Pittsfield.
*Secretary:* Walter L. Burrage.
42 Eliot Street, Jamaica Plain.
*Treasurer:* Arthur K. Stone,
Auburn Street, Framingham Center.
*Librarian:* Edwin H. Brigham, 8 The Fenway, Boston.

## Standing Committees for 1921-1922.

of arrangements.

Donald Macomber, A. W. Reggio, J. B. Swift, K. G. Percy, F. J. Callanan, Dwight O'Hara.

on publications and scientific papers.

E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

on membership and finance.

S. B. Woodward, A. Coolidge, Jr., Samuel Crowell, Gilman Osgood, Homer Gage.

on ethics and discipline.

Henry Jackson, T. J. Robinson, David Cheever, F. W. Anthony, R. H. Seelye.

on medical education and medical diplomas.

C. F. Painter, J. F. Burnham, A. G. Howard, R. L. De Normandie. H. P. Stevens.

on state and national legislation.

J. W. Bartol, F. G. Wheatley, E. H. Stevens, F. E. Jones, J. S. Stone.

on public health.

E. H. Bigelow, Annie L. Hamilton, E. F. Cody, Victor Safford, R. I. Lee.

## PRESIDENTS OF DISTRICT MEDICAL SOCIETIES.

### Vice-Presidents (*Ex-officiis*).

Arranged according to seniority of fellowship in The Massachusetts Medical Society.

| | |
|---|---|
| E. H. Bigelow | Middlesex South |
| A. J. Halpin | Middlesex North |
| A. I. Connell | Bristol South |
| F. B. Lund | Suffolk |
| J. J. Goodwin | Worcester |
| C. D. Knowlton | Norfolk |
| R. B. Rand | Plymouth |
| G. F. Dow | Middlesex East |
| F. E. Jones | Norfolk South |
| R. S. Ely | Worcester North |
| Sumner Coolidge | Bristol North |
| P. P. Johnson | Essex South |
| F. W. Snow | Essex North |
| C. P. Curley | Barnstable |
| G. L. Gabler | Hampden |
| J. A. Mather | Franklin |
| G. H. Thompson | Berkshire |
| A. J. Bonneville | Hampshire |

## COUNCILORS 1921–1922.

Elected by the District Medical Societies at their Annual Meetings, April 15 to May 15. 1921, and Councilors under the Terms of the By-Laws.

Note.—The initials M. N. C., following the name of a councilor, indicate that he is a member of the Nominating Committee. V.P. indicates that a member is a councilor by virtue of his office as president of a district society, and so vice-president of the general society. C. indicates that he is chairman of a Standing Committee. Ex-P. indicates ex-President.

Barnstable,

C. P. Curley, Provincetown, V.P.
E. F. Curry, Sagamore.
J. P. Nickerson, West Harwich, M.N.C.

Berkshire,

G. H. Thompson, North Adams, V.P.
Henry Colt, Pittsfield.
A. P. Merrill, Pittsfield.
B. W. Paddock. V.P. Pittsfield.
P. J. Sullivan, Dalton, M.N.C.

Bristol North,

Sumner Coolidge, Middleborough, V.P.
W. H. Allen, Mansfield.
F. A. Hubbard, Taunton, M.N.C.
H. G. Ripley, Taunton.

Bristol South,

A. I. Connell, Fall River, V.P.
A. W. Buck, Fall River.
E. F. Cody, New Bedford, M.N.C.
A. B. Cushman, South Dartmouth.
W. A. Dolan, Fall River.
R. W. Jackson, Fall River.
A. H. Mandell, New Bedford.
J. C. Pothier, New Bedford.

Essex North,

F. W. Snow, Newburyport. V.P.
R. V. Baketel, Methuen.
J. F. Burnham, Lawrence.
I. J. Clarke, Haverhill.
T. R. Healy, Newburyport, M.N.C.
G. E. Kurth, Lawrence.
J. J. O'Sullivan, Lawrence.
F. B. Pierce, Haverhill.
F. E. Sweetsir, Merrimac.
R. L. Toppan, Newburyport.

Essex South,

P. P. Johnson, Beverly, V.P.
S. P. F. Cook, Gloucester.
J. F. Donaldson, Salem.
H. K. Foster, Peabody.
W. T. Hopkins, Lynn.
J. F. Jordan, Peabody.
G. M. Kline, Beverley.
S. W. Mooring, Gloucester.
E. S. O'Keefe, Lynn.
W. G. Phippen, Salem, M.N.C.
A. N. Sargent Salem.
R. E. Stone, Beverly.

Franklin,

J. A. Mather, Greenfield, V.P.
H. G. Stetson, Greenfield, M.N.C.
C. L. Upton, Shelburne Falls.

Hampden,
G. L. Gabler, Holyoke, V.P.
F. H. Allen, Holyoke.
T. S. Bacon, Springfield.
E. P. Bagg, Jr., Holyoke, M.N.C.
M. D. Chisholm, Westfield.
G. B. Corcoran, West Springfield.
P. M. Cort, Springfield.
Philip Kilroy, Springfield.
E. A. Knowlton, Holyoke.
P. M. Lynch, Springfield.
L. E. Mannix, Chicopee Falls.
H. C. Martin, Springfield.
J. H. Quinn, Springfield.
J. M. Tracy, Springfield.

Hampshire,
A. J. Bonneville, Hatfield, V.P.
O. W. Cobb, Easthampton, M.N.C.
J. E. Hayes, Northampton.
H. B. Perry, Northampton.
D. M. Ryan, Ware.

Middlesex East,
G. F. Dow, Reading, V.P.
L. M. Crosby, Wakefield.
E. D. Richmond, Reading.
C. L. Sopher, Wakefield, M.N.C.
F. T. Woodbury, Wakefield.

Middlesex North,
A. J. Halpin, Lowell, V.P.
W. B. Jackson, Lowell.
J. H. Lambert, Lowell.
G. A. Leahey, Lowell.
J. A. Mehan, Lowell.
M. A. Tighe, Lowell.
E. J. Welch, Lowell, M.N.C.

Middlesex South,
E. H. Bigelow, Framingham, V.P., C.
E. A. Andrews, Newton.
G. A. Bancroft, Natick.
E. W. Barron, Malden.
C. O. Chase, Watertown.
Richard Collins, Waltham.
F. G. Curtis, Newton.
C. A. Dennett, Arlington.
D. C. Dow, Cambridge.
John Duff, Charlestown.
W. E. Fernald, Waverley.
G. W. Gay, Chestnut Hill, Ex.-P.
F. J. Goodridge, Cambridge.
L. S. Hapgood, Cambridge.
C. E. Hills, Natick.
F. R. Jouett, Cambridge.
H. J. Keaney, Everett.
C. E. Mongan, Somerville.
C. F. Painter, Newton, C.
H. S. Rowen, Brighton.
W. D. Ruston, Somerville.
L. F. Sise, Medford.
F. G. Smith, Somerville.
C. H. Staples, Malden.
E. H. Stevens, Cambridge, M.N.C.
A. K. Stone, Framingham Center, Treas.
F. R. Stubbs, Newton.
Fresenius Van Nuys, Weston.
H. P. Walcott, Cambridge, Ex-P.
G. L. West, Newton.
W. S. Whittemore, Cambridge.
Alfred Worcester, Waltham, Ex-P.

Norfolk,
C. D. Knowlton, Roxbury, V.P.
C. E. Allard, Dorchester.
W. B. Batchelder, Dorchester.
E. H. Baxter, Hyde Park.
D. N. Blakely, Brookline.
E. J. Brearton, Dorchester.
E. H. Brigham, Brookline, Libra.
J. P. Broderick, West Roxbury.
A. N. Broughton, Jamaica Plain, M.N.C.

Norfolk (*continued*),
W. L. Burrage, Jamaica Plain, Sec'y.
J. A. Ceconi, Dorchester.
T. F. Greene, Roxbury.
W. H. Greene, Roxbury.
W. A. Griffin, Sharon.
R. W. Hastings, Brookline.
F. C. Jillson, West Roxbury.
G. W. Kaan, Brookline.
W. B. Keeler, Roxbury.
Bradford Kent, Dorchester.
F. P. McCarthy, Milton.
M. V. Pierce, Milton.
H. H. Powers, Brookline.
Victor Safford, Jamaica Plain.
G. H. Scott, Roxbury.
C. F. Stack, Hyde Park.
Max Sturnick, Dorchester.
Augusta G. Williams, Brookline.

Norfolk South,
F. E. Jones, Quincy, V.P.
C. S. Adams, Wollaston.
O. H. Howe, Cohasset.
G. H. Ryder, Quincy, M.N.C.
G. M. Sheahan, Quincy.

Plymouth,
R. B. Rand, North Abington, V.P.
W. C. Keith, Brockton.
C. E. Lovell, Whitman.
Gilman Osgood, Rockland.
F. J. Ripley, Brockton.
F. G. Wheatley, North Abington, M.N.C.

Suffolk,
F. B. Lund, Boston, V.P.
J. L. Ames, Boston.
S. H. Ayer, Boston.
J. W. Bartol, Boston, Pres., C.
Robert Bonney, East Boston.
J. T. Bottomley, Boston.
V. Y. Bowditch, Boston.
E. G. Brackett, Boston.
J. E. Briggs, Boston.
F. J. Cotton, Boston.
E. A. Crockett, Boston.
Loretta J. Cummins, Boston.
Lincoln Davis, Boston.
W. J. Gallivan, South Boston.
J. E. Goldthwait, Boston.
G. S. Hill, Boston.
W. C. Howe, Boston, M.N.C.
J. C. Hubbard, Boston.
Henry Jackson, Boston, C.
D. F. Jones, Boston.
C. H. Lawrence, Boston, C.
E. A. Locke, Boston.
F. T. Lord, Boston.
Donald Macomber, Boston, C.
B. H. Metcalf, Winthrop.
R. H. Miller, Boston.
J. J. Minot, Boston.
F. S. Newell, Boston.
E. H. Nichols, Boston.
B. W. Pond, Boston.
Edward Reynolds, Boston.
W. H. Robey, Jr. ,Boston.
Stephen Rushmore, Boston.
D. D. Scannell, Boston.
C. L. Scudder, Boston.
C. M. Smith, Boston.
Myles Standish, Boston.
J. S. Stone, Boston.
E. W. Taylor, Boston, C.
Louisa P. Tingley, Boston.
F. H. Williams, Boston.

Worcester,
J. J. Goodwin, Clinton, V.P.
F. H. Baker, Worcester.
W. P. Bowers, Clinton, Ex-P.

Worcester (*continued*),
W. J. Delahanty, Worcester.
G. A. Dix, Worcester.
G. E. Emery, Worcester.
M. F. Fallon, Worcester
Homer Gage, Worcester.
R. W. Greene, Worcester.
David Harrower, Worcester, M.N.C.
E. L. Hunt, Worcester.
A. G. Hurd, Millbury.
W. L. Johnson, Uxbridge.
L. C. Miller, Worcester.
G. F. O'Day, Worcester.
C. B. Stevens, Worcester.
G. O. Ward, Worcester.
F. H. Washburn, Holden.
S. B. Woodward, Worcester, Ex-P., C.

Worcester North,
R. S. Ely, Townsend, V.P.
W. E. Currier, Leominster, M.N.C.
J. G. Henry, Winchendon.
H. R. Nye, Leominster.
A. H. Quessy, Fitchburg.

## CENSORS, 1921–1922.

Barnstable,
J. P. Nickerson, West Harwich, Supervisor.
C. E. Harris, Hyannis.
E. E. Hawes, Hyannis.
J. H. Higgins, Marstons Mills.
E. S. Osborne, West Dennis.

Berkshire,
Henry Colt, Pittsfield, Supervisor.
J. F. Crowley, Adams.
A. C. England, Pittsfield.
O. J. Brown, North Adams.
E. H. Howard, Pittsfield.

Bristol North,
F. A. Hubbard, Taunton, Supervisor.
H. B. Baker, Taunton.
A. R. Crandell, Taunton.
T. F. Clark, Taunton.
T. J. Robinson, Taunton.

Bristol South,
W. A. Dolan, Fall River, Supervisor.
R. W. French, Fall River.
C. J. Leary, New Bedford.
S. V. Merritt, Fall River.
I. N. Tilden, Mattapoisett.

Essex North,
R. V. Baketel, Methuen, Supervisor.
J. E. Bryant, Haverhill.
R. C. Hurd, Newburyport.
A. M. Hubbell, Haverhill.
F. S. Smith, North Andover.

Essex South,
J. F. Donaldson, Salem, Supervisor.
J. A. Shatswell, Beverly.
J. W. Trask, Lynn.
F. W. Baldwin, Danvers.
A. T. Hawes, Lynn.

Franklin,
C. L. Upton, Shelburne Falls, Supervisor.
H. N. Howe, Greenfield.
Charles Moline, Sunderland.
R. H. Philbrick, Northfield.
A. L. Newton, Northfield.

Hampden,
J. M. Tracy, Springfield, Supervisor.
C. H. Giroux, Three Rivers.
Frank Holyoke, Holyoke.
F. L. Everett, Springfield.
A. C. Eastman, Springfield.

Hampshire,
J. E. Hayes, Northampton, Supervisor.
F. L. Dow, Northampton.
W. J. Collins, Northampton.
H. G. Rockwell, Amherst.
W. P. Stutson, Cummington.

Middlesex East,
E. D. Richmond, Reading, Supervisor.
F. O. West, Woburn.
A. L. Brown, Winchester.
M. D. Sheehan, Stoneham.
Ralph Putnam, Winchester.

Middlesex North,
J. H. Lambert, Lowell, Supervisor.
E. J. Clark, Lowell.
G. A. Lavallée, Lowell.
J. A. Gage, Tyngsborough.
J. P. McAdams, Lowell.

Middlesex South,
F. G. Smith, Somerville, Supervisor.
C. B. Fuller, Waltham.
I. J. Fisher, West Newton.
James Glass, Framingham.
J. P. Nelligan, Cambridge.

Norfolk,
C. F. Stack, Hyde Park, (acting) Supervisor.
E. T. Rollins, Jamaica Plain.
T. J. Murphy, Roxbury.
G. G. Bulfinch, Brookline.
A. A. MacDonald, Dorchester.

Norfolk South,
G. M. Sheahan, Quincy, Supervisor.
A. J. Roach, South Braintree.
F. W. Crawford, Holbrook.
W. G. Curtis, Wollaston.
F. E. Burke, Quincy.

Plymouth,
F. J. Ripley, Brockton, Supervisor.
J. E. Drohan, Brockton.
E. J. Beaulieu, Whitman.
W. W. Fullerton, Brockton.
L. B. Reed, Plymouth.

Suffolk,
C. M. Smith, Boston, Supervisor.
G. B. Fenwick, Chelsea.
T. J. O'Brien, Boston.
J. S. Stone, Boston.
R. H. Vose, Boston.

Worcester,
F. H. Washburn, Holden, Supervisor.
L. R. Bragg, Webster.
E. H. Mackay, Clinton.
C. A. Sparrow, Worcester.
E. H. Trowbridge, Worcester.

Worcester North,
J. G. Henry, Winchendon, Supervisor.
W. F. Robie, Baldwinsville.
G. P. Norton, Fitchburg.
H. Jacques, Fitchburg.
C. S. Brigham, Leominster.

## COMMISSIONERS OF TRIALS.
## 1921–1922.

Barnstable, E. S. Osborne, West Dennis.
Berkshire, F. C. Downing, Stockbridge.
Bristol North, C. S. Holden, Attleborough.
Bristol South, D. P. O'Brien, New Bedford.
Essex North, J. F. Croston, Haverhill.
Essex South, J. E. Simpson, Salem.
Franklin, P. F. Leary, Turners Falls.
Hampden, R. H. Seelye, Springfield.
Hampshire, S. A. Clark, Northampton.
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Middlesex North, F. E. Varney, North Chelmsford.
Middlesex South, A. G. Griffin, Malden.
Norfolk, M. V. Pierce, Milton.
Norfolk South, N. S. Hunting, Quincy.
Plymouth, Gilman Osgood, Rockland.
Suffolk, Channing Frothingham, Boston.
Worcester, W. P. Bowers, Clinton.
Worcester North, E. P. Miller, Fitchburg.

## OFFICERS OF THE DISTRICT MEDICAL SOCIETIES.

Elected by the District Medical Societies.

(Some of these are corrected by the returns received since the annual meetings in the spring of 1921.)

Barnstable.—C. P. Curley, Provincetown, *President;* Harry D. Handy, Harwich, *Vice-President;* C. J. Bell, Wellfleet, *Secretary;* H. B. Hart, Yarmouthport, *Treasurer;* E. E. Hawes, Hyannis, *Librarian.*

Berkshire.—G. H. Thompson, North Adams, *President;* G. P. Hunt, Pittsfield, *Vice-President;* W. H. Walker, Jr., Pittsfield, *Secretary;* C. T. Leslie, Pittsfield, *Treasurer.*

Bristol North.—Sumner Coolidge, Taunton, *President;* W. O. Hewitt, Attleborough, *Vice-President;* A. R. Crandell, Taunton, *Secretary;* R. D. Dean, Taunton, *Treasurer.*

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Essex North.—F. W. Snow, Newburyport, *President;* F. D. McAllister, Lawrence, *Vice-President;* J. F. Burnham, Lawrence, *Secretary and Treasurer.*

Essex South.—P. P. Johnson, Beverly, *President;* J. B. MacDonald, Hathorne, *Vice-President;* G. E. Tucker, Salem, *Secretary;* G. Z. Goodell, Salem, *Treasurer;* C. M. Cobb, Lynn, *Librarian.*

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Middlesex East.—G. F. Dow, Reading, *President;* C. E. Ordway, Winchester, *Vice-President;* A. E. Small, Melrose, *Secretary;* Richard Dutton, Wakefield, *Treasurer;* G. W. Nickerson, Stoneham, *Librarian.*

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## Book Reviews.

*Repressed Emotions.* By Isador Coriat, M.D. New York: Brentano's. 1920.

The purpose of this small volume is, apparparently, to educate the popular mind in the principles of psycho-analysis. It is readable and interesting and likely to encourage lay readers, who may be in doubt as to the value of this method, to further pursuit of the subject. Although its teachings are those of the out-and-out Freudian school, the exclusive worship of the sex instinct, which is thought by its critics to appeal loudly and dangerously to the young and inexperienced thinker, is much less in evidence than might be expected.

Through the application of psycho-analytic methods of inquiry, the author traces the influence of repressed emotions from the remotest ages of the past and finds them at the root of many of the myths and customs of primitive peoples. As showing how they pervade literature he analyzes in detail the mental condition of various characters in novels. He emphasizes the value of psycho-analysis in education, particularly that of the young, as a preventive of future neurosis. Its influence upon character-formation, religion, ethics, art, society, delinquency, etc., is also positively set forth. Finally, he credits psycho-analysis, as elaborated by Freud, with "a new psychology, a new neurology and a new school of literary criticism." Such sweeping claims are at least debatable and, as regards neurology, far from the fact. The book also treats, rather largely and somewhat technically, on the treatments of functional nervous disorders regarding which certain dogmatic statements are made which may be misleading. It is asserted, for example, that "psycho-analysis can alone cure a neurosis," and the implication is made that it is the be-all and end-all of the therapy of such disorders. This dictum can hardly be reconciled with the opinion of authoritative advocates of this method to the effect that, even if it were possible, there is no reason for undertaking it in the majority of cases as they can be cured in much shorter ways.

* * *

## ACKNOWLEDGMENT.

To the local members of the profession and its kind friends who so generously contributed their automobiles for the entertainment of the visiting Fellows of the American Medical Association at its recent session, and thereby added so much to the enjoyment and success of the meeting, the Committee on Transportation, of the Entertainment Committee, wishes to acknowledge its deep sense of appreciation and thanks.

Lincoln Davis, *Chairman,*
George A. Leland, Jr., *Secretary.*

THE BOSTON
Medical and Surgical Journal
*Established in 1828*

THURSDAY, JUNE 30, 1921

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*Communications should be addressed to The Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston, Mass.*

## ANNUAL MEETING OF THE A. C. AND C. ASSOCIATION.

The American Climalogical and Clinical Association held its annual meeting at Lenox, June 3 and 4, under the leadership of President Carroll E. Edson of Denver. Dr. A. K. Storer is Secretary and Treasurer, and Dr. Cleveland Floyd is Recorder.

The papers read were of wide scope and value. Subjects presented were:

1. Occult Tuberculosis.
H. R. M. LANDIS, Philadelphia, Pa.
2. Hyperthyroidism and Tuberculosis.
PHILIP K. BROWN, San Francisco, Cal.
3. Subdiaphragmatic Inflammatory Conditions, Especially those Simulating Chest Conditions.
ROGER I. LEE, Cambridge, Mass.
4. A Study of Patients, Especially Asthmatics, with reference to Endocrine Dysfunctioning.
JAY PERKINS, Providence, R. I.
5. Discussion: The Management of Dyspnoea.
Dyspnoea due to Diseases of the Circulatory System.
R. H. BABCOCK, Chicago, Ill.
Dyspnoea due to Diseases of the Respiratory Organs.
G. W. NORRIS, Philadelphia, Pa.
Dyspnoea from Renal and Toxic Origins.
J. A. LICHTY, Pittsburgh, Pa.
By invitation the discussion was opened by
CHARLES H. HOOVER, M.D., Cleveland, Ohio.
6. Outdoor Schools. J. W. BRANNAN, New York.
7. Monitor Ventilation.
W. A. GRIFFIN, Sharon, Mass.
8. The Value of Vital Capacity Determinations in the Diagnosis of Myocardial Insufficiency.
J. H. PRATT, Boston, Mass.
9. Analysis of Eighty Cases of Functional Disease in Soldiers. J. M. SWAN, Rochester, N. Y.
10. Lyon Method of Draining the Biliary System for Diagnosis and Treatment.
F. J. DEVER, Bethlehem, Pa.
11. An Epidemic of Scarlet Fever with Interesting Complications.
DAVID R. LYMAN, Wallingford, Conn.
12. Extensive Rib Resection in the Treatment of Pulmonary Tuberculosis: Report of four cases.
D. C. PARFITT, Gravenhurst, Can.
13. Influence of Periapical Dental Infection upon the Leucocytes.
JUDSON DALAND, Philadelphia, Pa.
14. Pneumonia.
C. E. QUIMBY and JOHN McCABE, New York.
15. The Heart Muscle Changes in Pneumonia.
W. J. STONE, Pasadena, Cal.
16. Nathan Strong, Jr. A pioneer in the early history of Epidemic Cerebro-Spinal Meningitis.
W. R. STEINER, Hartford, Conn.
17. Three Cases of Artificial Pneumothorax (a) Bronchiectasis; (b) Pulmonary Abscess and Hemorrhage; (c) Acute Tuberculosis Pneumonia.
C. H. JOHNSON, Grand Rapids, Mich.
18. The Prevailing Beliefs about Infection in Tuberculosis. E. R. BALDWIN, Saranac Lake, N. Y.
19. A Case of Tuberculosis of the Spinal Cord. Lantern Slides.
C. C. BROWNING, Los Angeles, Cal.
20. X-ray Studies in Postural Rest.
G. B. WEBB, Colorado Springs, Colo.
21. Chaulmoogra Oil Derivatives in the Treatment of Pulmonary Tuberculosis.
P. K. BROWN and E. L. WALKER, San Francisco, Cal.
22. Tuberculosis of Husband and Wife.
H. L. BARNES, Wallum Lake, R. I.
23. Anti-tuberculosis Work in Canada.
G. D. PORTER, Toronto, Canada.
24. Tuberculosis Problem in Ex-Service Men.
J. O. COBB, Staten Island, N. Y.
25. Brehmer and His Teachings.
H. M. KINGHORN, Saranac Lake, N. Y.
26. Lymphoblastoma of the Stomach.
STERLING RUFFIN, Washington, D. C.
27. Group Practice.
GORDON WILSON, Baltimore, Md.

Anyone wishing especial information relative to these subjects can communicate with the authors. Dr. Floyd presents an abstract of one paper as follows:

### Studies of Thyroid Dysfunctioning with Special Reference to Asthma.

Dr. Perkins showed charts of patients representing the nerve symptoms which one finds in asthma, and demonstrated that the same line of symptoms, except for the difficult breathing, is found in patients complaining of so-called "nervousness," in some functional heart disease, in some cases of tuberculosis, in some cases of bronchitis and in all cases of asthma, and in practically all of the cases presenting these symptoms there is present a dysfunctioning of the thyroid gland. He cited numerous cases under the various headings showing the similarity in the history, and considered that the evidence warranted the conclusions that the various conditions noted were due to one and the same cause, usually thyroid dysfunctioning.

In asthma he considers that primarily the disease, especially as found in children, is due to hyperthyroidism, and that the disease can be cured in children. In asthma there is a vicious circle. The thyroid secretion increases the patient's nervousness and the nervousness increases the action of the thyroid. If this circle can be broken and the regular rest treatment simulated, the disease can be cured, and this is best done by giving sedative treatment such as small doses of apomorphine hydrochloride (Crystalline), tincture of hyoscyamus and tincture of valerian. This must be continued for a long time. In older people, where the thyroid has been over-active for many years, a condition is found frequently where the asthmatic attacks have ceased, but the patient is still disabled because of secondary functional or organic disturbances which still persist even though the original cause is removed. The same is true of these patients when treated. The asthmatic condition can be cured, but the secondary effects cannot wholly be removed.

He stated that in his opinion, while proteids and odors can bring on attacks of asthma, these merely act as excitants, and are not the real cause. Treating cases on the basis that the thyroid is the organ involved, not only do the asthmatic paroxysms disappear even in cases where they were brought on by proteids or odors, but other unpleasant manifestations brought on by proteids, such as indigestion or nausea, also disappear.

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## HAVERHILL TUBERCULOSIS ASSOCIATION.

Communities which are showing interest in health problems are urged to observe the work done by the Haverhill Tuberculosis Association, for this organization is one of the most progressive in the state.

The results obtained in that city are due in a great degree to medical direction and oversight, acting in close co-operation with the City Board of Health. The people of Haverhill have endorsed the work done in a liberal way.

The hospital for tuberculosis patients is a model of its kind and the situation is ideal.

The Association has felt that one great difficulty in the early recognition of tuberculosis has been lack of painstaking care in the early study of doubtful cases, and in order to assist physicians has prepared a simple history card for the physician's use on which may be recorded all essential facts relating to a suspected or recognized case.

The value of such a card lies in keeping before the doctor suggestions of the details of the essential investigation and a record of conditions found. These cards may be obtained at the Journal office and at the medical supply stores at a cost of five cents each. All profits from the sale will be used to continue and extend the work in Haverhill.

On a following page of this issue of the Journal will be found a reduced facsimile of both sides of this history card.

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## MEDICAL NOTES.

The American Society for the Control of Cancer announces the death of Dr. Harry M. Sherman, Regional Director for the states of California and Nevada. Dr. Sherman had been a director of the society since its organization and had taken up the work with renewed interest at the solicitation of Dr. Powers. He had recently given much attention to organizing the work and had traveled extensively, meeting various committees in both states.

Resolution.—At the recent meeting of the New York State Medical Society, the following resolution was passed:

> Be It Resolved, that the House of Delegates of the New York State Medical Society, in convention assembled at Brooklyn, New York, on May 2, 1921, does heartily endorse the efforts of the American Society for the Control of Cancer, and earnestly bespeaks the fullest coöperation of all the Branch Districts and County Societies in the State, to desseminate useful facts concerning this disease to the laity and to bring the members of the profession itself to a fuller appreciation of their responsibilities in this campaign.

The Sisters of Providence announce the opening of the new wing of St. Vincent Hospital, Worcester, Mass. This building, which has just been completed at a cost of $300,000, has fifty beds in private rooms, an operating suite of three rooms, a maternity ward, and complete pathological, chemical and X-ray laboratories. The private rooms are unusually large and the decorations and furnishings homelike.

## Miscellany.

### REPORT OF DEPARTMENT OF PUBLIC UTILITIES CONCERNING TELEPHONE RATES.

Petition of the Somerville Medical Society in the matter of the application to doctors of medicine, under certain circumstances, of the business classification of the New England Telephone and Telegraph Company.

This is a petition of the Somerville Medical Society objecting to doctors of medicine being included, under certain circumstances, within the business classification of the New England Telephone and Telegraph Company.

The company, in its schedule of rates, distinguishes between business and residence service, and makes a higher rate in the former case than in the latter. In its "commercial practices" it provides that "residence service rates permit the use of the service for social or domestic purposes, but do not permit extensive local use for business purposes." "The use of the service by . . . physicians . . . who have one main station only . . . is obviously primarily for business purposes," and "the advertising in any way of a station designation by any subscriber shall be considered as proper evidence that the use of the service is not primarily for social or domestic purposes." It has recently endeavored to apply these tests to physicians whose alleged primary use of their telephone service at their residences is for the pursuit of their profession. It is to this application of the classification that objection is made by the petitioners in this case.

We are not concerned, in this matter, with the difference between telephones at places of business as opposed to telephones at residences, and we do not, therefore, attempt, at the present time, to pass upon the soundness of this distinction. We are only concerned with the question of the use by doctors of medicine of telephones at their residences. The distinction which the company makes in the uses of telephones at residences is, taking their schedules and practices as a whole, one based upon the question of primary use, and the rate depends upon whether the primary use of the telephone at a residence is for business purposes, on the one hand, or for social or domestic purposes on the other. The phrases which occur in the company's "commercial practices," quoted above, beyond establishing this distinction, merely constitute presumptions or rules of evidence for the determination of the application of the test in particular cases. This was the interpretation given them at the hearing by the counsel of the company, and seems to us essentially sound. As all arguments in this case have been addressed solely to the application of this test in this particular matter, we do not regard the soundness of the distinction itself as necessarily involved in the decision of this case, and we do not, therefore, undertake to pass upon it at the present time.

The real questions before us, therefore, are whether the use made by a doctor of medicine of a telephone at his residence can ever properly be classed as a business use within the meaning of the schedules and practices of the company, and if so, when.

It is argued by the petitioners that the practice of medicine is not a business. This would undoubtedly be true if the test were the difference between business and professional use. Here, however, the contrast is between business and social or domestic use, and, as a consequence, we think the word "business" is meant to cover not only all businesses in the strictest sense of that term, but also all professions, vocations or occupations by which livelihoods are made. The underlying purpose of the classification is to enable the user of the telephone for social or domestic uses to have that service at a lower rate than the user for occupational purposes. While nobody can deny the noble and beneficent nature of the profession of medicine, it seems equally clear that nobody can deny that its practice is the method through which most doctors of medicine earn their living. So it seems to us evident that, when we endeavor to contrast occupational uses with social or domestic uses, we must include in the former term uses of the telephone at residences made in the course of the practice of medicine, however much we must recognize that many doctors of medicine are actuated in the practice of their profession not so much by the thought of pecuniary gain as by the desire to be of service to mankind.

Some emphasis has been put by the petitioners upon the fact that most of the use of doctors' telephone service is made not by the doctor calling up a patient, but by the patient seeking the advice or assistance of the doctor; or, to put it more briefly, that most of the calls are inward calls instead of outward ones. This does not seem to us to alter substantially the real nature of the transaction. It is probably true that many commercial houses pay large rents, not so much to enable them to be in a good position to call upon their customers, as to be readily accessible themselves to the demands of those who wish to deal with them. The same is undoubtedly true of the use of the telephone by many commercial concerns. Whether the telephone is there primarily to enable the doctor to call up a patient or a nurse, or to enable a nurse or a patient or the patient's family to call up the doctor, does not change the nature of the situation. It is, in any event, all connected with and an inseparable part of the doctor's practice of his profession.

We are, therefore, constrained to hold that there may be cases where the use of telephone service by a doctor of medicine at his residence constitutes primarily an occupational use within the meaning of the classification of the company as we construe it.

The next question is, under what circumstances use of the telephone by a doctor of medicine at his residence shall be regarded as primarily an occupational use.

We do not agree with the statement made in the company's "commercial practices" that "the use of the service by . . . physicians . . . who have one main station only . . . is obviously primarily for business purposes," and we are opposed to the application of this standard as a final test.

The petitioners contend that the word "doctor" is not only a designation of an occupation, but also a title and, in many instances, an important mode of identification. The company acquiesces in this view, and is entirely content that in the future the abbreviation "Dr." may appear in the telephone directory after a doctor's name without that being taken to indicate that his use of the telephone at his residence is primarily occupational as opposed to social or domestic. We understand that hereafter the abbreviation "Dr." will be inserted after the name of any doctor who desires it, without prejudicing in the slightest degree his claim that the use of his telephone at his residence is primarily social or domestic. The company feels, however, that if he desires the word "physician" inserted after his name, that this term cannot be justified as a title or mark of identification, but must stand as a description of his occupation, and, consequently, that where this word is desired after the name the company will feel justified in treating that service as primarily occupational service. This attitude of the company was developed by suggestions from the members of the Commission during the course of the hearings. It seems to us a reasonable one, and is, accordingly, adopted by us as the expression of the views of this Department, also, in this matter.

This leaves the situation, then, in this shape: A doctor of medicine who desires the word "physician" inserted after his name may be treated by the company as having definitely stated that the use of the telephone at his residence is primarily for occupational purposes. A doctor of medicine, on the other hand, who does not desire the word "physician" inserted after his name, but is content with the insertion of the abbreviation "Dr." thereafter, shall not be bound by the interpretation stated above, but shall pay business rates only (1) if he admits that his use of the telephone at his residence is primarily for occupational purposes, or, (2) if he does not concede this fact, but the evidence clearly indicates that this is the primary or chief use to which his telephone is being put,—which we hope will very rarely prove to be the case. Where, however, the use of his telephone at his residence is primarily for social or domestic purposes, the doctor is bound to pay only residential rates.

Very likely a number of physicians have reported their telephones one way or the other without the foregoing distinctions clearly in mind. It seems to us highly proper, therefore, that the company should base its future ratings of doctors upon such listing as may be adopted and such classification as may result therefrom in the light of this decision, and should disregard such listing and such classification of physicians at their residences as has been previously made. The company should, in brief, recanvass the situation anew.

In view of the consent of the company to comply with the foregoing views, it seems unnecessary at the present time to make any order in the premises except a formal one, and it is accordingly

Ordered, That this petition be dismissed without prejudice.

By order of the Commission,
(Signed) Andrew A. Highlands, *Secretary*.

The Index to Volume CLXXXIV of the Boston Medical and Surgical Journal, which volume ends with this issue (June 30, 1921), is being printed to go out to all subscribers so it may be used by those who desire to have their magazines bound into one volume. Anyone interested can secure a copy of this index, free, by making request for the same at the Journal office.

## COMMISSION ON MILK STANDARDS.

A summary report by the Commission on Milk Standards for the nine years ending December 10, 1920, recently published by the U. S. Public Health Service, contains matters of much interest to health officers and to chemists and bacteriologists.

Standard whole milk, says the report, should contain not less than 8.5 percent milk solids, not fat, and 3.25 percent milk fat; standard skim milk not less than 8.75 percent of milk solids; standard cream not less than 18 percent milk fat, and be free from all constituents foreign to normal milk.

The Commission believes that it is necessary to permit standardized and adjusted milk; this despite the fact that it recognizes the ease with which milk is contaminated and the difficulty of so controlling standardizing, skimming, homogenizing, souring, etc., as to prevent contamination and the use of inferior materials. The manipulation of the milk, however, should be controlled; the product should be labeled "adjusted milk" (the label showing the minimum guaranteed percent of fat); and the milk should comply with the sanitary and chemical requirements of unmodified milk.

To meet conditions in cities where milk contains less than 8.5 percent solids, not fat, milk sellers should be permitted to choose whether they will sell under the regular standard or under a guaranteed statement of composition. The sale of any normal milk should be permitted if its percent of fat is stated. If this is not stated, the sale should be held to be unlawful unless the milk contains 3.25 percent milk fat. Dealers selling under the guarantee plan should be required to state the guarantee conspicuously on all milk containers.

The number of bacteria in milk depends on dirt, temperature and age. Specific disease bacteria are not often present, and the difficulty of detecting them by laboratory methods renders these of little value in guarding milk against specific disease. The only practical safeguard is by medical, veterinary, and sanitary inspection and by pasteurization.

Bacterial counts indicate the safety and the "decency" of milk. Small numbers of bacteria indicate fresh milk, produced under clean conditions and kept cool; large numbers indicate dirty, warm, or stale milk.

Bacteria in milk are related to infant mortality. Children fed on milk containing few bacteria show a lower death rate than those fed on milk containing many. Bacteria harmless to adults may cause infant diarrhœa; and milk containing large numbers is apt to contain species capable of setting up intestinal inflammation in infants.

The interests of public health demand that the production and distribution of milk should include frequent bacterial laboratory examinations. In making the counts the methods of the American Public Health Association Laboratory Section should be used. To meet the charges often made that pasteurization is used to cover up careless or filthy methods, milk should be required to measure up to standard both before and after pasteurization.

Extensive study justifies the conclusion that bacterial analyses of duplicate samples of milk by routine methods in different laboratories vary about 28 percent. Tests of five samples will give fairly accurate results and will always permit any milk to be accurately graded. At least four of the five should show fewer bacteria than the maximum allowed for the grade awarded. Grading should never be based on a single sample.

The Commission on Milk Standards, which was established in March, 1911, by the New York Milk Committee, a voluntary organization, consists, at the present time, of seven public health officials, six bacteriologists, four chemists, and two agricultural experts. Fourteen have been physicians, three have long practical experience in the milk industry, and six have been connected with the production and control of certified milk.

## RESOLUTIONS BY THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

The following resolutions were passed at the 52nd annual meeting of the American Medical Editors' Association, June 7th, and the Secretary was authorized to send you a copy for publication:

WHEREAS: The medical restrictions of the Volstead Act, together with its various administrative and other interpretations and rules and regulations and enforcements, etc., constitute, in some of their effects, indictment of the medical profession and harrassment of the medical practitioner and the sick, and are obstacles to free pursuit of honest medical judgment and therapeutics, and have reacted to the detriment of society and the public health and are opposed to public policy;

AND WHEREAS: Some of these restrictions and rules and regulations and interpretations, etc., are not based upon concensus of medical experience and practice and established usage;

And whereas: It is apparent that they have not been framed and interpreted and administered with full appreciation of all matters involved;

And whereas: The precedent established by the Volstead Act in restricting medical practice should, if physicians value their therapeutic liberty, be met with a protest that will command attention;

And whereas: The point at issue is the right of the physician to select his remedies, and to decide what doses of these remedies each patient requires;

And whereas: This issue in no wise affects and has nothing to do with propaganda either for or against prohibition, but is purely a matter of preserving the necessary rights of the physician in the interests of public health and public policy:

Be it therefore resolved: That the American Medical Editors' Association protests against further undue regulation of therapeutic procedure by statutes or by administrative interpretation or regulation;

And be it resolved: That the Association requests of the proper authorities a review and revision of such existing statutes or rules or regulations as may be unduly restrictive of the therapeutic judgment and procedure of physicians.

We ask this for the preservation of the necessary rights of the medical profession and in the name of public welfare and wise public policy.

## NARCOTIC REGISTRANTS.

Collector of Internal Revenue John J. Mitchell has issued the last call to narcotic registrants who are due to file returns on or before July 1st. This means that all doctors, dentists, or druggists who wish to continue handling or prescribing narcotic drugs for the period July 1, 1921, to June 30, 1922, must file returns immediately to avoid the addition of a penalty.

Absolutely no extension of time will be granted narcotic registrants. In case of late filing a 25% penalty will be attached. If this is a second offense, the delinquent will also be held liable to a specific penalty in addition to the first.

The regular meeting of the New England Association for Physical Therapeutics was held on Tuesday, June 28th, at eight o'clock at the Hotel Victoria, 271 Dartmouth Street, Boston. The subject of the evening was "The Employment of Physical Auxiliaries to Increase the Efficiency of X-ray Therapy," by Drs. deKraft and Titus, of New York City.

## Correspondence.

### HOSPITAL AND DISPENSARY CLINICS A BANE TO THE GENERAL PRACTITIONER.

June 16, 1921.

*Mr. Editor:—*

I would like to call the attention of the profession to the further encroachments of the various hospitals and dispensaries of Boston on the practice of the medical men of Boston and vicinity.

It appears that all classes are welcome, particularly the well-to-do, in practically all the clinics of the city. The Peter Bent Brigham keeps open all day so as not to miss any patients that would be coming to the common doctors of Roxbury.

Now the Boston Dispensary is running a thriving clinic at night for the "poor" who have to work during the day. Most of these cases are veneral, men and women who are perfectly able to pay; but this institution appears to be so hungry for patients that they have no thought about the injury they do to the profession.

Most of the hospitals, and the Boston Dispensary, employ "social workers" who act as "runners" for the various institutions. Whether to hold their easy, lucrative positions, or otherwise, I cannot judge, but they offer the prospective patients the greatest specialists in the world, free, at their respective clinics. One of these young women even offered one of my patients two quarts of milk daily if she would bring her family and herself to the Boston Dispensary to be examined by the "experts" there.

Whether they are taught to or not, I do not know, but there is a movement among social workers, school nurses and others to divert all people who need medical services to the dispensaries and hospitals. Patronize and pauperize is the slogan.

The medical men who practice medicine as an avocation (wealthy men) who do not know the need of a dollar, are the ones to blame for the present situation. In their eagerness to have a clinic to practice on, they do not consider those whom they injure.

There are enough people in Greater Boston who need medical attention to keep every physician in our district busy were it not for the dispensaries and hospital clinics. As the late lamented Dr. Brooks truthfully said, all of the dispensaries and most of the hospital clinics could be closed with great benefit to the people as a whole.

In going through a large hospital a few days ago, I was struck with the large number of patients who should be at home, treated by their family physician, whose convalescence could be materially shortened by home surroundings and better medical attention; and a sad thing to say is that a number of these same patients were sent in by our brethren, who should know better.

There is a law in Massachusetts which gives an injured employee the right to go to any physician he chooses. Not one employee in a hundred knows of such a law, and when a man is injured he thinks that he must go to the cheap dispensary or hospital that his employer indicates. As a result, thousands of dollars are lost to the profession weekly.

The Somerville Medical Society (not the Massachusetts Medical Society) has taken this matter up, and I expect something will be done.

The Massachusetts Medical Society could remedy the abuses which are committed by the leaders of the profession, but, unfortunately, the officers of the Society have not of late interested themselves in the welfare of the general practitioner.

I may mention the telephone "increase" hearing, which was so successfully won by the Somerville Society. I did not hear anyone at the hearing representing the Massachusetts Medical Society. Who will say that the hearing should not have been asked for and conducted by the Massachusetts Medical Society?

Medical men can help, with benefit to themselves and their patients, by treating their cases at home or in "open" hospitals where the family doctor has control of his patient. Many of our best men have ruined their practice by sending patients to public hospitals to have the patients' ills diagnosed by immature house officers.

The remedy is partly up to the family doctor himself. He should see that material is not supplied to hospitals and dispensaries. If concerted action was taken by the profession, I am sure the growing hospital and dispensary nuisance could be considerably abated.

CHARLES MALONE, M.D.

46 St. John Street,
Jamaica Plain, Mass.

## NOTICES.

American Psychiatric Society.—At the seventy-seventh meeting of the American Medico-Pathological Association, held in Boston, May 31, to June 3, inclusive, a new constitution was adopted which provided, among other slight changes, a change in name of the organization, which will hereafter be known as the American Psychiatric Association.

The publication, *American Journal of Insanity*, Johns Hopkins Press, Baltimore, Md., will, hereafter, be the official organ of the Association and will be published under a new name, *The American Journal of Psychiatry*, while the former transactions bound in book form, will be omitted. The newly elected officers are: Albert M. Barrett, M.D., President, Ann Arbor, Mich.; H. W. Mitchell, M.D., Vice-President, Warren, Pa.; C. Floyd Haviland, M.D., Secretary-Treasurer, Middletown, Conn.

Resolution unanimously adopted by the Somerville Medical Society at a meeting held June 24, 1921.—*Resolved:* That the Somerville Medical Society by a unanimous vote enthusiastically supports and endorses the formation of a Mutual Insurance Society in the Massachusetts Medical Society as advocated in the Boston Medical and Surgical Journal, and that the Secretary of the Somerville Medical Society notify its members to attend any and all meetings that may be held for the formation of such insurance organization.

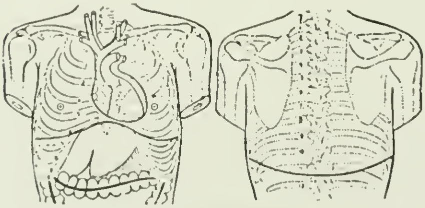
M. W. White, *President*,
Edmund H. Robbins, *Secretary*.

### Pulmonary Tuberculosis History Card.

Date 192 Age
Res. Occup. Nat.
F. M.
B. S.
Hist. cough in G. P's. Uns. or Aunts
P. H. Prolong. Cough Expect., Amt. etc.
Hemop. Pleurisy Eff. Pneum.
Bronch. La Grippe Typhoid
Fistula. Malaria Measles.
Enlarg. glands. Oth. dis. Syphilis Operat. or inju.
As a Child—strong robust,—slim wiry—delicate, Menst.
P. I.
Began with Stop. work
Cough Exp. Amt. etc. Strength
App. Digest. Bowels Sweats
Hoarseness. Sleep. Dyspn.

### Reverse Side.

P. E. Gen App. Ht. Max.
P. T. R. Teeth. Wt. Norm.
Pres.
M. Memb. Thro't. Fing. Loss of lbs.
Ht. Apex. Mur's.
Apx outlines Dep. above Clav.
Hgb. Thyroid Complic.
Diag. Sput.
(Cough and Long Breath) Treat.



| Stage | Prog. |
|---|---|
| Incip. | Favor |
| Mod ad. | Doubt |
| Far. ad. | Unfav. |

See Journal, page 711.

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SUPPLEMENT

Published weekly in Boston,
at 126 Massachusetts Avenue

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OF THE

# OFFICERS AND FELLOWS

Corrected to April 1

1921

## Alphabetical List

Prepared by the Librarian

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8 The Fenway
Boston, Massachusetts

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April 1, 1921

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A letter in place of a given first name not followed by a period is not an initial. It is a letter adopted by the individual instead of a name to distinguish him or her from others, or for the sake of euphony.

The last known address is given in this list.

## A

1917 Aaronson, Jacob..........Chelsea, 69 Congress Ave.
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1920 Adams, Donald Stansbury Worcester. Memorial Hosp.
1884 Adams, Herbert William...Dorchester (Boston). 744 Dudley St.
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1903 Adams, John Dresser......Brookline. Office, Boston. 45 Bay State Rd.
1910 Adams, Letitia Douglas....Boston. 175 Dartmouth St.
1891 Adams, Walter Henry......Northampton. 34 Bridge St.
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1912 Addelson, Nathan..........Roxbury (Boston). 155 Humboldt Av.
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1919 Ash, Richard Maurice.....Quincy. 43 School St.
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1914 Ayers, Charles Eaton......Worcester. 28 Pleasant St.
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## B

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1915 Bagnall, Elmer Stanley....Groveland. 9 School St.
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1891 Balch, Franklin Greene....Jamaica Plain (Boston). Office, Boston. 279 Clarendon St.
1892 Balcom, George Franklin †1911 Swanzey, N. H. 39 Main St.
1911 Balcom, Kenneth Ira......Worcester 112 Lincoln St.
1914 Baldwin, Edith Elizabeth..Springfield. 50 Buckingham St.
1888 Baldwin, Frederick William Danvers. 25 Conant St.
1895 Baldwin, Herman Trost....Chestnut Hill (Newton). 96 Middlesex Rd.
1896 Baldwin, Sanford Oscar....Framingham. 11 Union Av.
1912 Ball, Arthur Nelson.......Northampton. State Hospital.
1907 Ballou, Ambrose Roche.... Neponset (Boston). 280 Neponset Av.
1901 Balmer, William Edward..Whitinsville (Northbridge) Hill St.
1886 Bancroft, Edward Erastus.Wellesley. 604 Washington St.
1891 Bancroft, George Andrew..Natick. 33 West Central St.
1877 Bancroft, Winfred Baxter..South Boston (Boston). †1921 597 Broadway.
1898 Bangs, Charles Howard... Swampscott. Office, Boston. 657 Boylston St.
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1906 Bannon, John Hugh.......Lawrence. 341 Haverhill St.
1919 Banquer, Jacob Ellis......Mattapan (Boston). 1234 Blue Hill Av.
1905 Bardwell, Frederick Albert.Address unknown.
1908 Barker, Williston Wright..Dorchester (Boston). Office, Boston. 50 Congress St., Rm. 301a
1919 Barnard, Frederick Joseph.Greenfield. 132 Main St.
1892 Barnes, Francis John......Cambridge. 67 Brattle St.
1917 Barnes, Frederick Rigby..Fall River. 151 Rock St.
1899 Barnes, Harry Aldrich.....Brookline. Office, Boston. 520 Commonwealth Av.
1872 Barnes, Henry Jabez †1913 Northborough. Office, Boston. 429 Beacon St.
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1917 Barnes, Louis Dwight.....Lanesborough.
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1910 Barnum, Francis Goodell...Brookline. 85 Abbotsford Road.
1913 Barone, Joseph............Boston. 282 Hanover St.
1895 Barré, Joseph Aladin......Fall River. 1555 Pleasant St.
1900 Barrell, Charles Sewall....Boston. 425 Beacon St.
1899 Barrell, Mary Elizabeth...Worcester. 904 Main St.
1920 Barrett, Charles George...Worcester. St. Vincent's Hosp.
1907 Barrett, Edward William..Medford. 104 Salem St.
1904 Barrett, Michael Francis...Brockton. 231 Main St.
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1897 Batchelder, William Burdett Dorchester (Boston). 163 Washington St.
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1915 Bates, Charles Atwood.....Ashburnham. Main St.
1889 Bates, Everett Alanson.....Springfield. 55 Chestnut St.
1907 Bates, Lewis Beals........Ancon, Canal Zone, Panama, Ancon Hospital.
1897 Bates, Walter Simpson.....Barre. South St.
1916 Battershall, Jesse Wolfenden Attleborough 18 North Main St.
1879 Battershall, Joseph Ward..Attleborough. †1918 18 North Main St.
1911 Battershall, Mary Hannah Wolfenden Attleborough. 18 North Main St.
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1916 Berlin, Maurice George....Dorchester (Boston). 4 Esmond St.
1916 Berman, Myer Isadore.....Dorchester (Boston). 1071 Blue Hill Av.
1914 Berry, Charles Francis.....Boston. 541 Commonwealth Av.
1908 Berry, Gordon.............Worcester. } 19 Elm St.
1896 Berry, John Cutting....... Worcester. }
1890 Berry, Lauriston M †1908 Junction, Wyoming.
1917 Berry, Walter Durant. East Longmeadow (Longmeadow). 3 So. Main St.
1909 Berry, William Christopher.Jamaica Plain (Boston). Office, Boston. 419 Boylston St.
1901 }
1914 } Bertrand, Alexis Everiste.Lowell. 27 East 5th St.
1908 Besse, Frank Adelbert.....Orleans. Main St.
1907 Bessey, Earle Emerson.....Allston. 1690 Beacon St.
1883 Best, Enoch George........Greenfield. 473 Main St.
1920 Bettridge, Laurence Augustine Boston. City Hospital.
1901 Bicknell, Ralph Emerson...Swampscott. 148 Burrill St.
1909 Bieberbach, Walter Daniels.Worcester. 31 Pleasant St.
1907 Bier, Max Daniel..........Lawrence. 50 Concord St.
1906 Bigelow, Alice Houghton...Jamaica Plain (Boston). 14 Warren Sq.
1882 Bigelow, Charles Edwin....Leominster. 75 Merriam Av.
1905 Bigelow, Edward Bridge...Worcester. 1 Northampton St.
1883 Bigelow, Enos Hoyt.......Framingham Center. (Framingham). P. O. Box 213.
1913 Bigelow, James Bernard...Holyoke. 109 Suffolk St.
1874 Bigelow, William Sturgis..Boston. 56 Beacon St.
1919 Bill, José Penteado........Wayland. Office, Boston. 21 Bay State Rd.
1904 Binford, Ferdinand Augustus Hyannis (Barnstable). Main St.
1903 Binney, Horace............Boston. 403 Beacon St.
1919 Birdsall, Clarence Harlow. Haverhill. 50 Merrimack St.
1894 Birge, Ella Freeman.......Provincetown.
1883 Birge, William Spafard....Provincetown. Pearl St.

1885 Birmingham, Robert Michael Lawrence. 170 Salem St.
1909 Birnie, John Mathews.....Springfield. 6 Chestnut St.
1897 }
1917 } Biron, Joseph Frederick Rodolphe { Amesbury. 182 Main St.
1914 Bisbee, Ernest Sydney......Boston. 777 Tremont St.
1878 Bixby, Josiah Peet.........Woburn. 55 Elm St.
1910 Bixby, Oliver Edward......Lynn. 70 Broad St.
1901 Blaine, Walter Edward.....Mattapoisett. 72 Main St.
1900 Blair, George Kenniston...Salem. 311 Essex St.
1897 Blair, Orland Rossini......Springfield. 576 State St.
1904 Blair, Orrin Curtis.........Lynn. 99 Franklin St.
1882 Blaisdell, George Warren..Manchester. 21 Union St.
1913 Blaisdell, John Harper.... Winchester. Office, Boston. 45 Bay State Road.
1904 Blake, Allen Hanson.......West Somerville (Somerville). 117 Elm St.
1906 Blake, Gerald.............Boston. 657 Boylston St.
1888 Blake, Harrison Gray......Woburn. 13 Federal St.
1890 Blake, John Bapst.........Boston. 371 Commonwealth Av.
1901 Blake, Le Grande..........Riverside, R. I. 317 Bullock Point Av.
1898 Blakely, David Newton....Brookline. Office, Boston. 87 Milk St.
1913 Blanchard, Paul Drake....Lowell. 226 Merrimack St.
1902 Blanchard, Randall Howard Pittsfield. 7 North St.
1912 Blanchette, William Henry..Fall River. 212 Brightman St.
1904 Blenkhorn, James..........Stoneham. 301 Main St.
1910 Bliss, George Danforth †1921 Dorchester (Boston). 508 Washington St.
1905 Bliss, George Stephen......Pearl City. Oahu, Hawaii.
1897 Bliss, Jesse Leonti †1911 Holyoke. 370 High St.
1871 Blodgett, Albert Novatus †1913 Boston. 51 Mass. Av.
1903 }
1919 } Blodgett, Harold Percival } Leominster. 58 Church St.
1898 Blodgett, John Hammond..Boston. 390 Commonwealth Av.
1912 Blodgett, Stephen Haskell..South Lincoln (Lincoln). Office, Boston. 520 Beacon St.
1908 Blood, George Willard.....Fall River. 151 Rock St.
1920 Blood, Guy Frank.........Roslindale (Boston). 970 South St.
1906 Boardman, William Parsons.Boston. 388 Marlboro' St.
1885 Boardman, William Sidney..Boston. 63 Mt. Vernon St.
1916 Bober, Bessie Angela......Northampton. State Hospital.
1920 Boch, Joseph..............Springfield. 841 North St.
1919 Bock, Arlie Vernon........Boston. Mass. Gen. Hosp.
1912 Bodwell, William Mortimer.Framingham. 2 Lexington St.
1915 Boehm, Julius Benjamin.. Brooklyn, N. Y. Greenpoint Hospital.
1910 Bogan, Frederick Leon.....Dorchester (Boston). Office, Boston. 1069 Boylston St.
1920 Bogan, Isabel Katherine...Beverly. Beverly Hospital.
1878 Boland, Elisha Shepard....South Boston (Boston). 809 Broadway.
1920 Boland, John Joseph......Pittsfield. 334 North St.
1916 Bolduc, Alfred George.....Address unknown.
1891 Bolton, Charles James.....Mattapan (Boston). 450 Walk Hill St.
1904 Bond, Walter Legrand.....West Somerville (Somerville). 322 Highland Av.
1889 Bond, Willis George.......Revere. 76 Beach St.
1915 Bone, Herman David......Gardner. 83 Chestnut St.
1903 Bonnar, James Miller......New Bedford. 90 Hillman St.
1914 Bonelli, Raymond Peter....Brookline. Office, Boston. 261 Hanover St.
1911 Bonneville, Alfred Joseph..Hatfield. 43 Main St.
1901 Bonney, Charles Austin, Jr..New Bedford. 67 Bedford St.
1903 Bonney, Robert............East Boston (Boston). 7 Princeton St.

1897 Boom, Augustus Keefer....Adams. 51 Park St.
1877 Booth, Edward Chauncey †1915 Somerville. 40 Boston St.
1907 Boothby, Walter Meredith..Rochester, Minn. Mayo Clinic.
1902 Borden, Charles Richardson Cobb Brookline. Office, Boston. 520 Commonwealth Av.
1906 Borden, George Edward....Adamsville, R. I.
1893 Bossidy, John Collins......Boston. 419 Boylston St.
1911 Bostick, Warren John......West Springfield. 376 Main St.
1919 Bottero, Giovanni Domenico Brookline. Office, Boston. 261 Hanover St.
1897 Bottomley, John Taylor....Boston. 165 Beacon St.
1897 Boucher, George Alphonse..Brockton. 20 Clinton Av.
1905 Boutwell, Horace Keith.....Brookline. 39 St. Paul St
1913 Bouvier, Charles William..Holyoke. 251 Maple St.
1912 Bowditch, Harold......... Boston. 520 Commonwealth Av
1903 Bowditch, Henry Ingersoll.Boston. 86 Bay State Road
1881 Bowditch, Vincent Yardley.Boston. 506 Beacon St.
1915 Bowen, Alfred Preston.....Lynn. 17 Fayette St.
1913 Bowen, Enos Emanuel.....East Boston (Boston). 290 Sumner St.
1912 Bowen, James Francis.....Springfield, Ill.
1887 Bowen, John Templeton....Boston. 14 Marlboro' St.
1912 Bowers, George Francis Haskell Newton Highlands (Newton). 156 Woodward St.
1879 Bowers, Walter Prentice...Clinton. 264 Chestnut St.
1891 Bowker, Everett M.........Brookline. 322 Harvard St.
1894 Bowles, George Hall.......Plymouth, N. H. 2 Russell St.
1892 Bowman, Fred Raymond...Boston. 8 Cumberland St.
1914 Boyd, Francis Peter.......Springfield. 10 Chestnut St.
1919 Boyd, James Francis......Providence, R. I. Rhode Island Hosp.
1896 Boyd, James Van Wagner..Longmeadow.
1885 Boyd, Samuel George......San Francisco, Calif. 133 Geary St.
1911 Boyden, Arthur Henry... Worcester. 390 Main St.
1901 Boyer, Joseph Napoleon....Springfield. 175 State St.
1906 Boyle, Jeremiah Joseph....Cambridge. 1431 Cambridge St.
1903 Boyle, John Francis.......Lowell. 32 Whipple St.
1902 Brace, George Wells †1921 Westfield. 26 Elm St.
1886 Brackett, Elliot Gray.......Boston. 166 Newbury St.
1919 Brackett, Nathaniel Parker.Worcester. City Hosp.
1895 Bradford, Cary Carpenter..Southbridge. 67 Main St.
1873 Bradford, Edward Hickling Boston. 133 Newbury St.
1878 Bradford, Henry Withington Wolfeborough, N. H.
1906 Brady, Frank Robert.....Lowell. 237 Stevens St.
1903 Brady, James Francis......Boston. 599 Tremont St.
1908 Brady, Joseph Edward.....Brockton. 231 Main St.
1912 Brady, William Francis....Holyoke. 109 Suffolk St.
1871 Bragdon, George Albert †1906 Middletown, Conn.
1890 Bragdon, Horace Elwood...East Boston (Boston). 7 Central Sq.
1894 Bragg, Frank Adelbert.....Foxborough. School St.
1902 Bragg, Leslie Raymond....Webster. 260 Main St.
1884 Brainerd, John Bliss.......Brookline. Office, Boston. 419 Boylston St.
1907 Brainerd, Walter Scott....Bradford (Haverhill). Office, Haverhill. 91 Merrimack St.
1909 Brant, Austin..............Boston. 483 Beacon St.
1915 Brassil, Timothy Francis..Cambridge. 297 Broadway.
1903 Brayton, Roland Walker...Dorchester (Boston). 62 Welles Av.
1909 Brearton, Edward John....Dorchester (Boston). 2 Pearl St.
1885 Breck, Samuel............Brookline. Office, Boston. 238 Newbury St.
1901 Breed, Nathaniel Pope.....Lynn. 9 Washington Sq.
1920 Breed, William Bradley...Boston. 402 Marlboro' St.
1911 Bremer, John Lewis.......Boston. 416 Beacon St.
1887 Brennan, John Joseph......Worcester. 390 Main St.
1902 Brennan, Joseph
1918 Thomas Louis Lowell. 45 Fort Hill Ave.
1913 Breslin, John George......Boston. 514 Commonwealth Av.
1914 Bresnihan, Frank Nesdel..Cambridge. 269 Harvard St.
1919 Brett, Afley Leonel........Boston. 240 Newbury St.
1893 Brewster, George Washington Wales Boston. 213 Beacon St.
1898 Brickett, Beatrice Hannah.Norfolk Downs (Quincy). 108 Sharon Rd.
1907 1918 Brickley, William Joseph. Boston. 496 Commonwealth Av.
1912 Brides, Arthur Edward....New Haven. Conn. N. H. Club.
1899 Bridgman, Burt Nicholas...Umzumbe, Morrison's Post. Natal, S. Africa.
1919 Bridgewood, David........Brockton. 424 Prospect St.
1893 Briggs, Charles Albert..... Assonet (Freetown).
1880 Briggs, Edward Cornelius..Chestnut Hill (Newton). Office, Boston. 129 Marlboro' St.
1883 Briggs, Frederick Melancthon Boston. 56 Bay State Road.
1917 Briggs, Joseph Emmons...Boston. 477 Beacon St.
1899 Briggs, Lloyd Vernon......Boston. 64 Beacon St.
1920 Briggs, Maurice Taggart..Lynn. 11 Shore Drivve.
1903 Brigham, Clarence Sumner.Leominster. 61 Pearl St.
1868 Brigham, Edwin Howard..Brookline. Office, Boston. 8 The Fenway
1912 Brigham, Francis Gorham.Boston. 35 Bay State Rd.
1907 Brigham, Fred Clayton....Springfield. 349 State St.
1907 Bright, James Cooper......Fall River. 518 South Main St.
1915 Brindamour, Joseph Edmond Holyoke. 79 High St.
1906 Brindisi, Rocco............Boston. 149 Richmond St.
1917 Bristol, De Los Judson, Jr..Boston. 374 Marlboro' St.
1908 Broderick, Frank Patrick..Jamaica Plain (Boston). 67 South St.
1911 Broderick, Thomas Frederick Brighton. Office, Boston. 501 Beacon St.
1884 Broidrick, James Patrick †1914 Jamaica Plain (Boston). 815 Center St.
1920 Brodrick, Francis Sidney..Boston. City Hospital.
1906 Brooks, Edith May........Boston. 483 Beacon St.
1874 Brooks, Lawton Stickney †1913 Petersham.
1890 Brooks, William Allen Brookline. Office, Boston. 375 Commonwealth Av.
1893 Brough, David Dandie.....Boston. City Hall Annex.
1899 Broughton, Arthur Nicholson Jamaica Plain (Boston). 46 Eliot St.
1878 Broughton, Henry White...Jamaica Plain (Boston). 7 Lakeville Pl.
1896 Brousseau, William Gilbert..Cambridge. 2222 Mass. Av.
1920 Browder, Newton Clarence.Worcester. City Hospital.
1911 Brown, Arthur Aloysius....Worcester. Park Bldg.
1910 Brown, Arthur Linwood....Winchester. Office, Boston. 419 Boylston St.
1898 Brown, Edward Wells.....Northampton. 16 Center St.
1884 Brown, George Artemas....Barre. Broad St.
1904 Brown, George Christopher.Worcester. 507 Main St.
1917 Brown, Henry Seabury....Detroit, Mich. Harper Hospital.
1919 Brown, Josiah Henry......West Newton (Newton). 15 Shaw St.
1907 Brown, Lloyd Thornton....Boston. 372 Marlboro' St.
1893 Brown, Martin Millard.....North Adams. 117 Main St.
1873 Brown, Orland Jonas......North Adams. 112 Main St
1902 Brown, Percy...............Boston. 155 Newbury St.
1914 Brown, Ralph Neally.......Malden. 621 Main St.
1915 Brown, Roy Farrington...Fall River. 555 North Main St.
1906 Brown, Wallace Everett....N. Y. City. 135 W. 47th St.
1888 Brown, Wilfred Gardner...Plymouth. 4 North St.
1908 Brown, William James....Boston. 1109 Boylston St.
1909 Brown, William John......Reading. 18 Salem St.
1914 Browne, William Edward..Boston. 587 Beacon St.
1881 Browne, William Tyler....Norwich, Conn. 275 Broadway.

1898 Brownrigg, Albert Edward Nashua, N. H. Highland Springs Sanitarium.
1888 Brownrigg, John Sylvester Roxbury (Boston). 16 Delle Av.
1895 Bruce, Daniel Angus.......Atlantic (Quincy).
1917 Bruce, Jacob Baldwin.....Boston. 496 Commonwealth Av.
1896 Bruce, John Angus........Everett. 699 Broadway.
1913 Brunelle, Arthur Lord.....New Bedford. 97 Mt. Pleasant St.
1898 Brunelle, Pierre...........Lowell. 843 Moody St.
1919 Brunick, Patrick Vincent..South Boston (Boston). 554 Broadway.
1917 Bryan, William Alvin.....Hathorne (Danvers). State Hospital.
1893 Bryant, Alice Gertrude....Boston. 502 Beacon St.
1906 Bryant, Clarence Edmund..Hyde Park (Boston). 101 Highland St.
1901 Bryant, Frederick.........Worcester. 778 Main St.
1892 Bryant, Giles Waite.......West Somerville (Somerville). 36 College Av.
1911 Bryant, John..............Boston. 338 Marlboro' St.
1902 Bryant, John Edmund.....Haverhill. 50 Merrimack St.
1874 Bryant, Lewis Lincoln †1920 Cambridge. 354 Harvard St.
1909 Bryant, Mason David......Lowell. 31 Harvard St.
1909 Bucholz, Carl Hermann....Cambridge. Office, Boston. 139 Beacon St.
1893 Buck, Augustus Walker....Fall River. 252 Pine St.
1914 Buck, Clifton Leon........Danvers. 35 High St.
1882 Buck, Howard Mendenhall.Boston. 857 Beacon St.
1899 Buck, Maurice Allen.......Billerica.
1917 Buck, William Edgar......Wilmington. Church St.
1914 Buckley, Daniel Joseph....Arlington. 240 Broadway.
1913 Buckley, George Ambrose..Brockton. 28 Main St.
1906 Buckley, William Stephen..Brighton (Boston). 253 Market St.
1911 Budington, Harold Fairchild Springfield. 958 State St.
1917 Budreski, Alphonse Frank.Brockton. 25 Ames St.
1899 Buehler, George Van Buskirk Cambridge. Office, Boston. 1075 Boylston St.
1903 Bufford, John Henry.......Brookline. Office, Boston. 220 Clarendon St.
1898 Buffum, Herbert Edwin....Somerville. 129 Perkins St.
1874 Bulfinch, George Greenleaf.Brookline. 526 Harvard St.
1920 Bullard, Carleton Wheeler.Newburyport. 110 High St.
1880 Bullard, William Norton...Boston. 89 Marlboro' St.
1920 Bunker, Henry Alden, Jr...Medfield.
1915 Bunker, Sidney Moore.....Waverley (Belmont). 121 Mill St.
1907 Burbeck, Edward Kimball..Marblehead. Devereux Mansion.
1906 Burgess, Charles James....Lawrence. 37 Whitman St.
1905 Burke, Francis Ramon.....Quincy. 1200 Hancock St.
1910 Burke, George Herbert.....Springfield. 175 State St.
1892 Burke, James Joseph......Easthampton. 21 Center St.
1896 Burke, Michael Francis....Natick. 12 West Central St.
1901 Burke, Walter Thomas.....Medford. 112 Salem St.
1899 Burke, William Henry, Jr..Cambridge. 2 Bond St.
1902 Burley, Benjamin Thomas.Worcester. 19 High St.
1906 Burnett, Francis Lowell....Boston. 205 Beacon St.
1897 Burnett, Frank Hollis.....Brockton. 153 Main St.
1920 Burnett, Joseph Hamilton.East Boston (Boston). 1189 Bennington St.
1920 Burnett, Nathan Lowe....Cambridge. 157 Windsor St.
1894 Burnham, Elmond Arthur..Boston. 138 Huntington Av.
1901 Burnham, Joseph Forrest..Lawrence. 301 Essex St.
1899 Burns, Frederick Stanford.Boston. 237 Marlboro' St.
1892 Burns, Hiram Hutchins....Plymouth. 9 North St.
1910 } 1915 } Burns, Robert Francis.... Fitchburg. 108 Highland Av.
1915 Burns, Walter Linn ......Lynn. 81 North Common St.
1886 Burrage, Walter Lincoln...Jamaica Plain (Boston). 42 Eliot St.
1907 Burrows, Marion Cowan...Lynn. 68 Ocean St.
1915 Burt, Clarence Edward....New Bedford. 298 Union St.
1911 Burt, Edward Walter.....New Bedford. 180 Elm St.
1920 Burton, Oscar Augustus...Wellesley. 32 Dover Rd.
1885 Burton, Stephen Casper....Pittsfield. 36 Oxford St. †1918
1909 Bush, Arthur Dermont.....Grand Forks, N.D. Univ. North Dakota
1874 Bush, John Standish Foster.Boston. †1915
1906 Bushold, Fred George.....Lawrence. 60 Saunders St.
1916 Butler, Alice Etta.........Boston. 57 Cambridge St.
1899 Butler, Charles Shorey.....Boston. 257 Newbury St.
1916 Butler, David Mathew.....Brockton. 12 Cottage St.
1918 Butler, Edmund John.....Cambridge. 56 Putnam St.
1916 Butler, Francis Joseph....Worcester. 69 Lincoln St.
1897 Butler, George Edward... Fall River. 674 So. Main St.
1892 Butler, John Edward......Dorchester (Boston). 471 Columbia Rd.
1905 Butler, Patrick Francis....Boston. 510 Commonwealth Av.
1903 Butler, Richard Bernard...Fall River. 251 Pine St.
1917 Butler, Samuel ...........West Medway (Medway). Main St.
1904 Butterfield, George Kittredge Worcester. Grafton State Hospital.
1884 Buzzell, Daniel Thompson.Wilmington.
1892 Bychower, Victor..........Malden. 226 Cross St.
1895 Byrne, Charles Armstrong..Hatfield. 46 Main St.
1912 Byrne, Claudius James.... Worcester. 1066 Main St.
1904 Byrnes, Harry Francis.....Springfield. 4 Chestnut St.
1920 Byrnes, John Peter........Springfield. 820 State St.

## C

1898 Cabot, Hugh..............Ann Arbor, Mich. Dept. of Surgery Univ. of Mich.
1892 Cabot, Richard Clarke.....Boston. 1 Marlboro' St.
1911 Cady, Frederic Benjamin Mooers Cambridge. 10 Chauncey St.
1886 Cahill, Charles Sumner....Cambridge, 311 Prospect St.
1920 Cahill, Henry Philip......Boston. 514 Commonwealth Av.
1910 Cahill, John William......Worcester. 390 Main St.
1915 Caines, Richard John Ridgeway Boston. 248 Newbury St.
1903 Caisse, George Emile......Lowell. 724 Merrimack St.
1919 Calderwood, Edward Swazey Roxbury (Boston). 223 Warren St.
1909 Calitri, Constant...........Lawrence. 100 Jackson St.
1891 Calkin, Barry Howes......Stellarton, N. S.
1894 Calkins, Cheney Hosmer...Springfield. 383 Union St.
1903 Calkins, Irving Romaro....Springfield. 299 Central St.
1862 Calkins, Marshall †1893 Springfield. 14 Maple St.
1884 Call, Emma Louisa.......Cambridge. 5 Washington Av.
1873 Call, Norman †1910 Brookline. 61 Sewall Av.
1908 Callahan, Henry Alphonsus.Jamaica Plain (Boston). 2 Wise St.
1915 Callahan, John Francis....Brockton. 231 Main St.
1918 Callanan, Francis Jervois.Roxbury. Office, Boston. 520 Commonwealth Av.
1887 Callanan, Sampson Aloysius.Roxbury (Boston). 109 Warren St.
1911 Camfill, Robert Emmet.....Springfield. 148 Chestnut St.
1902 Canedy, Charles Francis...Greenfield. 39 Federal St.
1872 Canedy, Francis Joel †1913 Shelburne Falls
1920 Canedy, Frederick Snow...Wellfleet. (Shelburne). 60 Bridge St.
1912 Canney, Ellen Rose........New Bedford. 552 County St.
1904 Cannon, Walter Bradford..Cambridge. Office, Roxbury (Boston). 240 Longwood Av.
1913 Capeles, Thomas Francis...Haverhill. 191 Merrimack St.
1898 Carden, Charles James....Haverhill. 83 High St.
1908 Carey, Bernard William...Fitchburg. 6 Prichard St.
1916 Carey, Francis Arthur.....Taunton. 87 Washington St.
1920 Carey, Joseph Henry......Dorchester (Boston). 1483 Dorchester Av.
1896 Carleton, Dudley..........Springfield. 137½ State St.

1898 Carleton, Ralph............Springfield. 10 Temple St.
1906 Carley, Frederic James....North Attleborough. 34 High St.
1909 Carley, Margaret Elizabeth New York City, N. Y. 993 Park Av.
1911 Carlisle, Frank Henry.....State Farm (Bridgewater).
1908 Carlton, Frank Carr.......Salem. 16 North St.
1906 Carney, Patrick Joseph.....Worcester. 626 Southbridge St.
1915 Carpenter, Robert John....North Adams. 111 Church St.
1910 Carr, Arthur Wyman......Bridgewater. Main St.
1920 Carr, Earl Burton.........Melrose. N. E. Sanatarium.
1909 Carr, Gladys Lydia........Fresno, Calif. Burnett Sanatorium.
1906 Carr, Percy Whitman......Hyde Park (Boston). 1172 River St.
1909 Carroll, Charles Curtis.....Dorchester (Boston). 10 Esmond St.
1911 Carroll, Henry Gerald.....Peabody. Office, Salem. 309 Essex St.
1892 1919 Carroll, James Aloysius. Boston. 411 Marlboro' St.
1905 Carroll, John Joseph...... Holyoke. 192 Chestnut St.
1899 Carroll, John Philip.......Woburn. 16 Winn St.
1888 Carroll, Thomas Francis...Lowell. 219 Central St.
1897 Carruth, Sidney Stetson...Dorchester (Boston). 713 Dudley St.
1918 Caruso, Septimio..........Medford. Office, Boston. 256 Hanover St.
1913 Carvell, Hanford..........Gloucester. 1038 Washington St.
1905 Carvill, Maud............. Somerville. Office, Boston. 101 Newbury St.
1902 Cary, Foster Harrington...Denver, Colo. 645 Metropolitan Bldg.
1918 Casey, Chester Arthur..... Roxbury (Boston). R. B. Brigham Hospital.
1912 Casey, John Francis.......Allston (Boston). 94 Franklin St.
1916 Cass, Frank Ozro.........Provincetown. 284 A Commercial St.
1908 Casselberry, Clarence Marmaduke Brookline. Office, Boston. 514 Commonwealth Av.
1912 Cassels, Louis Raymond... Worcester. 60 Franklin St.
1920 Cassidy, Franklin Chester Medford. 14 Washington St.
1908 Cassidy, James Joseph.....Lowell. 11 Riverside St.
1913 Castleman, Philip.......... Boston. 483 Beacon St.
1914 Caswell, Bertram Horace.. Medford. 355 Main St.
1910 Caswell, Walter Emery....Campello (Brockton). 1147 Main St.
1903 Caulfield, Thomas Edward Woburn. 14 Church Av.
1905 Cavanaugh, Thomas Edward Holyoke, 241 Maple St.
1909 1915 Ceconi, John Aloysius Dorchester (Boston). 544 Washington St.
1905 Celce, Frank Frederick....Holyoke. 264 Maple St.
1905 Celce, Jean Henriette......Holyoke. 264 Maple St.
1913 Chace, Fenner Albert......Fall River. 373 North Main St.
1888 Chadbourne, Arthur Patterson Washington, D. C. 1779 Mass Av.
1917 Chadwell, Orville Rogers..Jamaica Plain. Office, Boston. 510 Commonwealth Av.
1895 Chadwick, Henry Dexter...Westfield. State Sanatorium.
1916 Chalfen, Samuel Edward..Cambridge. 1129 Cambridge St.
1906 Chalmers, Hattie Elizabeth. Marlborough. 32 West Main St.
1908 Chalmers, Robert..........Woburn. 397 Main St.
1895 Chamberlain, William Eugene Rutland.
1914 Chamberlin, Harold Augustus Boston. 205 Beacon St.
1920 Chambers, Ralph Miller...Westborough. State Hospital.

1907 Champion, Merrill Edwin..Boston. 545 State House.
1905 Chandler, Clarence Luther. Roxbury (Boston). R. B. Brigham Hospital.
1915 Chandler, Harold Beckles..West Newton (Newton). Office, Boston. 34½ Beacon St.
1883 Chandler, Henry Beckles...West Newton (Newton). Office, Boston. 34½ Beacon St.
1888 Chandler, Norman Fitch...Medford. 82 High St.
1911 Chandler, Thomas Evans...Boston. 19 Bay State Rd.
1873 1878 Channing, Walter..... Brookline. Boylston St. and Chestnut Hill Av.
1898 Chapin, Clifford Samuel....Great Barrington. 321 Main St.
1891 Chapin, Delia Lucretia.... Springfield. 56 Temple St.
1906 Chapin, Laurence Dudley..Springfield. 20 Maple St.
1885 Chapin, Walter Henry.....Springfield. 27 Pleasant St.
1915 Chapin, William Andrew Robertson Springfield. 6 Maple St.
1899 Chapman, Charles Ratchford Springfield. 174 State St.
1920 Chapman, William Harden. Hingham. Kilby St.
1917 Chaput, Lucien Romeo....Haverhill. 3 Washington Sq.
1913 Charbonneau, Noe Napoleon Grafton. Fisherville P. O.
1886 Charles, Orlando Warrington Bryantville (Pembroke).
1900 Charteris, Mary Alena.....Worcester. 15 Irving St.
1908 Chase, Charles Otis........Watertown. 51 Mt. Auburn St.
1908, Chase, Gilman Leeds......Clinton. 185 Chestnut St.
1907 Chase, Harrison Ayer......Brockton. 129 West Elm St.
1909 Chase, Heman Baker......Hyannis (Barnstable). Main St.
1886 Chase, Heman Lincoln.....Brookline. Office, Worcester. 223 Salisbury St.
1902 Chase, Henry Melville.....Boston. 520 Commonwealth Av.
1915 Chase, Joseph, Jr..........East Weymouth. 655 Broad St.
1914 Cheever, Austin Walter.....Boston. 510 Commonwealth Av.
1886 Cheever, Clarence Alonzo.. Hingham. Main St.
1902 Cheever, David............ Boston. Peter Bent Brigham Hosp.
1891 Chenery, William Elisha...Boston. 222 Huntington Av.
1886 Cheney, Frederick Edward Concord. Office, Boston. 64 Commonwealth Av.
1920 Cheney, Robert Cartwright. Boston. 233 Charles St.
1905 Chesley, Alfred Ervan.....Lawrence. 477 Essex St.
1917 Chisholm, Lawrence Chesley.. Allston (Boston) 1315 Commonwealth Av.
1906 Chisholm, Miles Dudley....Westfield. 106 Elm St.
1910 1920 Choate, Alton Jay....... Ithaca, N. Y. Cornell University.
1900 Choate, Horace Henry.....Gloucester. 54 Middle St.
1903 Cholerton, Herbert.........West Somerville (Somerville). 94 College Av.
1902 Christian, Henry Asbury...Boston. R. B. Brigham Hospital.
1908 Christiernin, Charles Leonard East Orange. N. J. Office, New York City, N. Y. 1 Madison Av.
1915 Chronquest, Alfred Peter..West Roxbury (Boston). U.S.P.H.S. Hosp. No. 41.
1919 Church, Charles Noble....Millbury.
1912 Church, Claude Henry.....Tonopah, Nevada.
1918 Churchill, Anna Quincy.... Dorchester (Boston). 32 Percival St.
1920 Churchill, Edward De Los. Boston. Mass. Gen. Hosp.
1890 1919 Churchill, Frank Spooner. Milton. 17 Canton Av.
1906 Churchill, John Darling....Plymouth. 63 Court St.
1895 Chute, Arthur Lambert....Boston. 352 Marlboro' St.
1888 Cilley, Daniel Plummer....Westborough. 30 East Main St.
1913 Claffy, John McMahon.....Millerville, Md.

1891 Clancy, William Henry....East Cambridge (Cambridge). 80 Otis St.
1900 Clap, Edmund Wright......Boston. 390 Commonwealth Av.
1892 Clapp, Frank Horace......North Grafton (Grafton).
1920 Clark, Cecil Whitehouse ..Newtonville (Newton). 306 Walnut St.
1869 Clark, David †1908 Springfield. 155 Long Hill.
1916 Clark, De Witt Scoville...Salem. 32 Washington Sq.
1901 Clark, Edward James......Lowell. Lowell Corp. Hosp.
1901 Clark, Ezra Warren †1914 Brockton. 3 Garden Road.
1913 Clark, Frank Robinson.....Newtonville (Newton). 227 Walnut St.
1901 Clark, Frederick Timothy...Westfield. 52 Broad St.
1893 Clark, George Henry.......Holyoke. 233 Elm St.
1905 Clark, George Oliver.......Boston. 67 Marlboro' St.
1911 Clark, Harry Ainsworth....U. S. Army Fort Adams. R. I.
1906 } 1913 } Clark, John Donovan......Palm Beach, Fla. 231 Clematis Av
1886 Clark, Joseph Payson......Boston. 71 Marlboro' St.
1889 Clark, Leonard Brown.....Waverley (Belmont). 36 Sycamore St.
1897 Clark, Mary Wilson...... Medford. 4 Washington St.
1892 Clark, Sidney Avery.......Northampton. 16 Center St.
1903 Clark, Thomas Francis.....Taunton. 62 Broadway.
1910 Clark, Webster Kimball....Greenfield. 4 Chapman St.
1907 Clark, William Irving, Jr...Worcester. 53 West St
1914 Clark-MacLeod, Emily.....Boston. 260 Newbury St.
1901 Clarke, Genevieve..........Cambridge. 825 Mass. Av.
1911 Clarke, Harry Carver......Lynn. 183 North Common St.
1904 Clarke, Inez Louise........Cambridge. 825 Mass. Av.
1888 Clarke, Israel James.......Haverhill. 112 Emerson St.
1910 Clarke, Joshua Williams...Attleborough. 48 Bank St.
1902 Clarke, Louis Henry.......Holyoke. 282 Maple St.
1915 Clarke, Mary Ella..........Malden. 629 Main St.
1915 Clarke, Willis Earl........Malden. 490 Pleasant St.
1897 Cleary, James.............Cambridge. 770 Mass. Av.
1901 Cleaves, Ezra Eames......Rockport. 38 Main St.
1908 Cleaves, Helen Frances Taft Palmer. Monson State Hospital
1874 Clement, George Wilmot...Roxbury (Boston). 275 Warren St.
1911 Cleveland, Heber Howe....Portland, Me. 690 Congress St.
1920 Cliff, Frederica Leigh.....Boston. 427 Shawmut Av.
1875 Cliff, Leander Albert.......Boston. 427 Shawmut Av.
1919 Clifford, Randall..........Boston. 636 Beacon St.
1920 Cline, Samuel.............Boston. 1069 Boylston St.
1901 Cloudman, Harry Radcliffe Brockton. 32 Clinton Av.
1919 Clute, Howard Merrill.....Boston. 638 Commonwealth Av.
1911 Clymer, George, Jr........Boston. 126 Bay State Rd.
1919 Coates, Everett Walton....Fitchburg. 44 Snow St.
1892 Cobb, Albert Crocker......Marion. Front St.
1895 Cobb, Carolus Melville.....Lynn. 10 Nahant St.
1907 Cobb, Chester Thompson.. Northampton. 91 South St.
1893 Cobb, Farrar..............Boston. 419 Boylston St.
1889 Cobb, Frederic Codman....Boston. 11 Marlboro' St.
1912 Cobb, Gardner Nathan.....Worcester. 24 Elm St.
1897 Cobb, Oliver Warren...... Easthampton. 159 Main St.
1919 Cobb, Stanley.............Boston. 52 Blossom St.
1914 Coburn, Harry Ray........Westford.
1904 Coburn, Horace Fordyce...Lowell. 9 Central St.
1898 Cochran, William James...Natick. 50 West Central St.
1914 Cochrane, Robert Carlyle..Boston. 86 Bay State Rd.
1895 Codman, Ernest Amory....Boston. 227 Beacon St.
1912 Cody, Edmond Francis.....New Bedford. 105 South 6th St.
1916 Cody, Peter White........Lawrence. 229 Andover St.
1885 Coffin, Arthur Baylies......Dorchester (Boston). 10 Rosedale St.
1907 Coffin, Frank Herbert......Haverhill. 91 Emerson St.
1896 Collin, Rockwell Augustus..Boston. 350 Commonwealth Av.
1919 Collin, Whitman King.....Boston. 366 Commonwealth Av.
1887 Cogan, Joseph Ambrose....Boston. 419 Boylston St.
1892 Cogswell, George Proctor..Cambridge. 18 Concord Av.
1896 Cogswell, William.........Haverhill. 51 North Av.
1917 Cohen, Joseph Powitzer...Brookline. Office, Boston. 464 Commonwealth Av.
1916 Cohen, Milton Michael....Roxbury (Boston). 40 Gaston St.
1918 Cohen, Samuel Adams.....Boston. 483 Beacon St.
1910 Colberg, Peter Albert......Worcester. 17 Stebbins St.
1897 Colburn, Harry Hayford...Boston. 103 Mt. Vernon St.
1896 } 1920 } Colby, Fred Bennett.....Gardner. 8 Vernon St.
1912 Cole, Arthur Judson.......Holbrook. North Franklin St.
1919 Colgate, Charles Henry, Jr..Rockland. 16 Webster St.
1915 Collins, Frank Laforest.... Rowley. Main St.
1910 Collins, Joseph Daniel.....Northampton. 150 Main St.
1903 Collins, Richard...........Waltham. 837 Main St.
1899 Collins, William James.... Northampton. 150 Main St.
1908 Collins, William Morris.... Lowell. 267 Central St.
1918 Colmes, Abraham.........Roxbury (Boston). 572A Warren St.
1881 Colt, Henry................Pittsfield. 193 South St.
1879 Comey, Perley Pierce †1920 Augusta, Ga. 872 Hickman Road.
1883 Conant, William Merritt...Boston. 486 Commonwealth Av.
1913 Condrick, John Joseph.....Brockton. 68 Main St.
1883 } 1900 } Cone, Dwight Eleazer.. { Fall River. 938 South Main St.
1913 Conley, Brainard Francis..Malden. 203 Main St.
1919 Conlin, Matthew George...Worcester. 1038 Main St.
1909 Conlin, Robert Emmett....Woburn. 353 Main St.
1906 Conlon, Frank Aloysius....Lawrence. 301 Essex St.
1891 Connell, Arthur Irving.....Fall River. 456 South Main St.
1909 Connelly, John Edward....Brookline. 9 Sewall Av.
1902 Conner, Homer Leigh......Haverhill. 85 Emerson St.
1897 Connor, Charles Frank.....New Bedford. 11 North Orchard St.
1910 } 1919 } Connor, George James...Haverhill. 50 Merrimack St.
1902 Conro, Arthur Clifton......Attleborough. 15 Mechanic St.
1906 Conroy, Edward Cornelius.Andover. Office. Lawrence. 263 Essex St.
1915 Constans, Frank Elmore...Brockton. 7 Main St.
1914 Cook, James Henry........Braintree. 346 Washington St.
1914 Cook, John William........Mansfield. 150 North Main St.
1905 Cook, Philip Howard......Worcester. 771 Main St.
1893 Cook, Snow Parker Freeman Gloucester. 111 Main St.
1885 Coolidge, Algernon.........Brookline. Office. Boston. 613 Beacon St.
1893 Coolidge, John Nelson..... New York City, N. Y. 1 Madison Av.
1901 Coolidge, Sumner..........Middleborough. Lakeville State Sanatorium.
1898 } 1903 } Coon, George Bailey.....Howard, R. I. State Hosp.
1907 } 1915 } Coon, William Hall......{ Bridgeport, Conn. Dept. of Health.
1912 Cooney, Margaret Blanche..Haverhill. 67 Winter St.
1909 Cooney, Michael Edward..Northampton. 16 Center St.
1920 Cooper, Alden Vernon.....Lynn. 4 Congress St.
1892 Cooper, Almon............Brookline. 114 Park St.
1920 Cooper, Olive Alfreda.....Boston. Long Isld. Hosp.
1915 Copeland, Elmer Humphrey Northampton. 168 Elm St.
1906 Corbett, Jeremiah Joseph..Malden. Office, Boston. 520 Beacon St.
1911 Corcoran, George Bartlett..West Springfield. 30 Park St.
1909 Corcoran, John Gilbert.....Hamilton.
1905 Corey, Frederick Hall......Rockland. 439 Union St.
1907 Coriat, Isador Henry.......Boston. 416 Marlboro' St.
1913 Cornish, Solon Washington. Everett. 79 Winthrop St.
1907 Cornwall, Andrew Payne...Brookline. Office, Boston. 483 Beacon St.

1904 Cort, Parker Martin.......Westfield. State Sanatorium.
1917 Cosgrove, Joseph Justin...Springfield. 175 State St.
1906 1913 Costello, John Henry... Dorchester (Boston). 68 Pleasant St.
1920 Coté, Corinne Rhea........Worcester. Memorial Hosp.
1907 1919 Cotter, Edward Joseph. Jamaica Plain (Boston). 777 Center St.
1912 Cotter, Timothy Francis....Haverhill. 50 Merrimack St.
1917 Cottle, Louis Albert....... Worcester. 50 Orange St.
1897 Cotton, Frederic Jay.......Boston. 520 Commonwealth Av.
1895 Coues, William Pearce.....Boston. 31 Mass. Av.
1892 Councilman, William Thomas Boston. Office, Roxbury (Boston). 240 Longwood Av.
1911 Coupal, James Francis.... Washington, D. C. 1807 California St. N. W.
1893 Courtney, Joseph William..Boston. 94 Bay State Road.
1892 Cousins, Nicholas William.Waltham. 17 Crescent St.
1910 Cowles, William Lee.......Boston. 483 Beacon St.
1887 Cowles, William Norman.. Jamaica Plain (Boston). 42 Southbourne Rd.
1907 Cox, Ann Caroline.........Boston. 146 Mass. Av.
1914 Cox, Oscar Francis.......Boston. 877 Beacon St.
1905 Cox, Simon Francis........Vanceboro, Me.
1913 Cox, Stanley Cullen........Holyoke. 242 Maple St.
1901 Coyne, Thomas Joseph.....Roxbury (Boston). 636 Dudley St.
1914 Crabtree, Ernest Granville..Cambridge. Office, Boston. 99 Commonwealth Av.
1919 Crabtree, Harvard Hersey.Boston. 205 Beacon St.
1889 Craigin, George Arthur....Boston. 374 Marlboro' St.
1891 Cram, John Wesley........Colrain.
1915 Crandall, Walter Mildkiff..Lawrence. 1075 Essex St.
1896 Crandell, Arthur Richmond.Taunton. 48 Church Green.
1899 Crandon, Le Roi Goddard..Boston. 366 Commonwealth Av.
1906 Crane, Bayard Taylor.....Rutland. Maple Av.
1909 Crane, Clarence............Boston. 520 Beacon St.
1920 Crane, George Edward.....Haverhill. 151 Merrimack St.
1899 1907 Crawford, Francis Xavier. Boston. Deer Island Hospital.
1910 Crawford, Frank Wallis....Holbrook. North Franklin St.
1920 Crawford, Joseph Warrington North Adams. 191 Main St.
1918 Crawford, Lawrence Pears. Wollaston (Quincy). 75 Elm Ave.
1885 Crawford, Sarah Marcy †1911 Newton Center (Newton). 194 Ward St.
1914 Creamer, William Henry...Fall River, 466 N. Main St.
1908 Creely, Oscar Slade........Watertown. 63 Mt. Auburn St.
1906 Cregg, Francis Aloysius....Lawrence. 477 Essex St.
1919 Crimmin, Leo Philip.......Brockton. 57 West Elm St.
1907 Crispo, Peter Timothy.....Fall River. 439 Bedford St.
1900 Crittenden, Samuel Wright Woburn. Elmwood St.
1909 1919 Crittendon, George Alanson Springfield. 27 Maple St.
1894 Croacher, Anna Wood......New Bedford. 325 Pleasant St
1892 Crocker, Benton Pulsifer...Foxborough. South St.
1887 Crocker, Susan Elizabeth †1901 Los Angeles, Calif. 819 W. 34th St.
1891 Crockett, Eugene Anthony.Boston. 298 Marlboro' St.
1898 Croft, Benjamin Pomeroy..Bernardston. Office, Greenfield. 39 Federal St.
1903 1920 Crofts, Nicholas Matthew.North Adams. 45 Main St.
1917 Croissant, Charles AugustusWorcester. 10½ High St.
1913 Croke, Loula Ward........Dorchester (Boston). 22 Mather St.
1914 Cronin, Herbert Joseph....Cambridge. 863 Mass Av.
1899 Cronin, Michael John......Roxbury. Office, Boston. 520 Beacon St.
1898 Cronin, Thomas Joseph....Worcester. 49 Pleasant St.
1909 Crosbie, Arthur Hallam....Boston. 520 Commonwealth Ave.
1903 Crosby, Leander Marshall..Wakefield. Office, Boston. 419 Boylston St.
1910 Crosby, Walter Hiram.....Brighton (Boston). 305 Faneuil St.
1912 Cross, Albert Elmer....... Worcester. 390 Main St.
1899 Cross, William Patrick.....South Boston (Boston). 491 Broadway.
1881 Croston, John Francis.....Haverhill. 83 Emerson St.
1920 Crothers, Bronson.........Boston. 222 Marlboro' St.
1885 Crowell, Samuel...........Dorchester (Boston). 8 Monadnock St.
1897 Crowley, Jeremiah Francis.Adams. 15 Park St.
1920 Cruff, Frederick Ellery....West Roxbury (Boston). 62 Maple St.
1911 Cuddy, James Francis.....Athol. 585 Main St.
1916 Cullen, Charles Andrew... Springfield. 400 North Main St.
1899 Cummin, John White......Boston. 9 Mass. Av.
1901 Cummings, Alvah Cochran.Newton. 337 Washington St.
1911 Cummings, Dana Frank....Natick. 12 E. Central St.
1876 Cummings, Edwin Francis.†1920 Revere. Office, Boston. 43 State House.
1904 Cummings, John Joseph 1920† Worcester. 53 Pleasant St.
1901 Cummings, Morton Everett Malden. 358 Pleasant St.
1888 Cummings, Mott Alvah.....Winchester. 69 Church St.
1905 Cummins, Loretta Joy.....Boston. 45 Bay State Road.
1919 Cunha, Manuel Felix......Lowell. 258 Merrimack St.
1920 Cunning, Daniel Sylvester Dorchester (Boston). 120 Norfolk St.
1913 Cunningham, Allan Rowe..Boston. 356 Commonwealth Av.
1903 Cunningham, John Henry, Jr. Boston. 46 Gloucester St.
1914 Cunningham, Joseph Henry Cambridge. 959 Mass. Av.
1920 Cunningham, Richard Augustine Roslindale (Boston). 50 Walworth St.
1920 Cunningham, Thomas Donald 1370 Gilpin St. Denver, Colo.
1914 Cunningham, Thomas Edward, Jr. Cambridge. 5 Ellery St.
1919 Cunningham, Thomas Patrick Worcester. 875 Main St.
1905 Curley, Clarence Proctor...Provincetown. Commercial St.
1917 Curran, George Lally......North Adams. 63 Eagle St.
1914 Curran, John Francis......Worcester, 505 Pleasant St.
1919 Curran, Louis Frederic....Boston. 42 West Newton St.
1905 Curran, Simon Francis.....Dorchester (Boston). 104 Norfolk St.
1917 Currie, Inez Margaret.....Webster. 59 School St.
1912 Currier, Cyrus Richardson.Sandwich. Main St.
1900 Currier, William Eugene...Leominster. 87 Merriam Av.
1890 Currier, William Hale.....Pittsfield. 69 Linden St.
1898 Curry, Edmund Farnham..Fall River. 499 Hanover St.
1908 Curry, Ernest Francis.....Sagamore (Bourne). Keith Block.
1915 Curtin, John Francis...... North Abington (Abington). 6 Plymouth St.
1909 Curtis, Charles Leverett...Salem. 78 Federal St.
1887 Curtis, Francis George.....Chestnut Hill (Newton). 399 Hammond St.
1910 Curtis, Harlan Fuller......East Longmeadow (Longmeadow). South Main St.
1890 Curtis, Henry Fuller.......Somerville. 145 Perkins St.
1920 Curtis, Robert Dudley.....Boston. 311 Beacon St.
1899 Curtis, William Goodwin...Wollaston (Quincy). 10 Grand View Av.
1906 Cushing, Arthur Alden.....Brookline. 108 Marion St.
1913 Cushing, Harvey...........Brookline. Office, Roxbury (Boston). Peter Bent Brigham Hospital.
1881 Cushing, Hayward Warren.Boston. 70 Commonwealth Av.

1887 Cushman, Andrew Bernard. South Dartmouth (Dartmouth).
1882 Cushman, George Thomas..Roxbury (Boston). 46 Dudley St.
1911 Cushman, Howard Lewis..Methuen. 70 Broadway.
1906 Cusick, Lawrence Francis..Nahant. Office Boston. 99 Newbury St.
1898 Cusick, Thomas Francis....Taunton. 126 Weir St.
1898 Cutler, Charles Norton.....Chelsea. 309 Washington Av.
1872 Cutler, Elbridge Gerry.....Boston. 214 Beacon St.
1916 Cutler, Elliott Carr.......Brookline. 61 Heath St.
1912 Cutler, George David......Brookline. Office, Boston. 311 Beacon St.
1914 Cutler, Myron Fred........Webster. 129 Main St.
1915 Cutler, Raymond William..Worcester. 28 Pleasant St.
1908 Cutter, Irving Taylor......Winchester. 310 Main St.
1906 Cyr, Emile Edouard.......Lawrence. 81 Bradford St.

## D

1905 Dacey, Cornelius Joseph...Brockton. 12 Cottage St.
1902 Dadmun, Eliza Josephine..Boston. 350 Commonwealth Av.
1904 Dailey, Edward Joseph....Somerville. 46 Bow St.
1918 Daland, Ernest Merrill....Boston. 483 Beacon St.
1920 Dalrymple, Sidney Collingwood Newton Center (Newton). 859 Beacon St.
1913 Dalton, Charles Howard...Somerville. 476 Broadway.
1908 Dalton, George Frederick..Springfield. 175 State St.
1882 Daly, Bernard Thomas.....Roxbury (Boston). 320 Dudley St.
1905 Daly, Jeremiah James.....Andover. Office, N. Andover 26 Second St.
1898 Daly, Timothy Joseph......Lawrence. 62 Bradford St.
1896 Daly, William Joseph......Boston. 31 Mass. Av.
1902 Dame, Fred Russell........South Braintree (Braintree). 1010 Washington St.
1895 Damon, Arthur Llewellyn..North Wilbraham (Wilbraham). Chapel St.
1906 Dana, Harold Ward........Brookline. Office, Boston. 483 Beacon St.
1891 Dane, John................Jamaica Plain. Office. Boston. 29 Marlboro' St.
1906 Danforth, Harland Abbott..Lynn. 7 Anoka Pl.
1878 Daniels, Edwin Alfred.....Boston. 302 Newbury St.
1920 Daniels, Louis Riley......Watertown. 16 Summit Rd.
1916 Daniels, Ora George......Canton. Mass. Hospital School.
1908 Darling, Arthur Edwin.....Lynn. 189 Chatham St.
1895 Darling, Charles Balfour..Roxbury (Boston). Office, Boston. 483 Beacon St
1894 Darling, Eugene Abraham.Cambridge. 33 Concord Av.
1907 Dascombe, Otho Lee.......Waltham. 333 Moody St.
1900 Daudelin, Simeon Alphonse Worcester. 11 Elm St.
1871 Davenport, Bennett Franklin. †1910 Watertown. 20 Summit Rd.
1877 Davenport, Francis Henry.Boston. 390 Commonwealth Av.
1887 Davenport, James Henry...Providence, R. I. 210 Benefit St.
1918 Davidson, Alfred..........Chelsea. 155 Chestnut St.
1906 Davidson, Henry James Duff Springfield. 26 Maple St.
1891 Davidson, Kallman Meyer..Roxbury (Boston). Office, Boston. 483 Beacon St.
1920 Davidson, William Brown Rutland. State Sanatorium.
1895 Davis, Bessie Delano.......Cambridge. 21 Magazine St.
1911 Davis, Charles Allen †1921 South Dennis (Dennis).
1899 Davis, Charles Henry......South Hamilton (Hamilton).
1888 Davis, Ella Maxfield......Holyoke. 188 Chestnut St.
1906 Davis, Ernest Leland......Springfield. 175 State St.
1907 Davis, Frank Albert.......Brookline. Office, Boston. Hotel Brunswick.
1913 Davis, Frederick Durand..Springfield. 310 Main St.
1915 Davis, George Rufus......Marlborough. 133 W. Main St.
1914 Davis, Henry Levi.........Lynn. 22 Harwood St.
1899 Davis, Lincoln.............Boston. 205 Beacon St.
1906 Davis, Minot Flagg........Boston. 15 Charles St.
1897 Davis, Stephen Rich.......Lynn. 16 New Ocean St.
1905 Davison, Arthur Howard...Dorchester (Boston). 564 Washington St.
1914 Dawson, Roger Paul......Allston. Office, Boston. 205 Beacon St.
1911 Day, Charles Orrin........Hingham. Main St.
1916 Day, Edward Philip.......Dorchester (Boston). 385 Columbia Road.
1905 Day, Hilbert Francis......Boston. 45 Bay State Rd.
1920 Dayton, Neil Avon........Westborough. State Hospital.
1914 Deacy, John Joseph........Lawrence. 32 Lawrence St.
1893 Deal, Edward Elvin.......Winchester. 36 Calumet Road.
1892 Deal, George Francis......Malden. 807 Salem St.
1896 Dean, Ralph Denniston....Taunton. 152 High St.
1866 Deane, Asahel Sumner †1902 Taunton. 27 Harrison Av.
1907 Dearborn, George Van Ness..Cambridge. 6 Mason St.
1908 Dearborn, Henry Follansby..Methuen. Office. Lawrence. 193 Garden St.
1920 De Cesare, Nicandro Francis Lawrence. 162 Jackson St.
1914 Deering, Charles Fuller....Danvers. 57 Elm St.
1905 Deering, George Edwin....Worcester. 129 Pleasant St.
1890 Dehn, Edward William....New Bedford. 23 Linden St.
1919 Deitch, John..............Roxbury (Boston). 438 Warren St.
1886 DeLand, Charles Airmet...Warren. 7 Quaboag St.
1898 De Langle, Charles Petit...St. Helena, Calif. R. 2, Box 16.
1884 Delahanty, William Joseph.Worcester. 5 Trumbull Sq.
1885 1912 Delano, Samuel...........Hartford, Conn. State Sanatorium.
1893 De Lue, Frederick Spaulding Needham. Office, Boston. 99 Newbury St.
1917 DeMarco, Thomas Andreas.Springfield. 686½ Main St.
1911 Dempsey, James Edward...Newton. 449 Washington St.
1895 Denig, Blanche Alpine.....Boston. 541 Boylston St.
1911 Dennen, Ralph Waite......Waltham. 258 Moody St
1900 Dennett, Alonzo Gustin....Lowell. 40 Riverside St.
1897 Dennett, Charles Augustus.Arlington. 754 Mass. Av.
1898 Dennett, Daniel Clement...Winchester. 7 Washington St.
1906 Denning, Edward John....South Boston (Boston). Office, Boston. 45 Bay State Road.
1901 Denning, William Edward..Worcester. 22 Pleasant St.
1896 Dennison, Archibald Sayre.Lynn. 7 Franklin St.
1895 Denny, Francis Parkman...Brookline. 111 High St.
1915 Denny, George Parkman...Boston. 3 Gloucester St.
1904 DeNormandie, Robert Laurent Boston. 355 Marlboro' St
1916 Derby, Frederick William..Boston. 166 Huntington Av.
1903 Derby, George Strong......Boston. 23 Bay State Rd.
1919 Derby, Joseph Patrick....Worcester. City Hospital.
1892 Derby, William Parsons....Saxonville (Framingham). Old Conn. Path.
1914 Dervin Laurence James....Somerville. 218 Highland Av.
1916 Dervin, Peter John........Dorchester (Boston). 157 Harvard St.
1920 Desmond, Margaret Ellen..Boston. Long Isld. Hosp.
1909 Devenny, Joseph Henry....Dorchester (Boston). 2 King St.
1904 Devere, Fred Hewitt.......Auburn, R. I. 677 Park St.
1884 Devine, William Henry....South Boston (Boston). 595 Broadway.
1903 Devlin, Peter Clarke.......Lynn. 784 Western Av.
1886 Dewey, Charles Gipson.....Dorchester (Boston). 44 Alban St.
1906 Dewing, Louis Alexander..Boston. 215 Huntington Av.
1893 Dewis, John William.......Brookline. Office, Boston. 69 Newbury St.
1913 DeWolf, Charles Wentworth Wakefield. 10 Avon St.

1887 Dexter, Franklin..........Beverly. Office, Boston. 247 Marlboro' St.
1905 Dexter, Fred Fay..........Springfield. 175 State St.
1917 Dexter, Roderick Besnard..Dorchester (Boston). State Hospital.
1915 Dezell, Frederick Burr....Lynn. 293 Euclid Av.
1907 Dickinson, Gyrdie Willie...Winthrop. 260 Pleasant St.
1898 Dickson, Richard Ensign...Holyoke. 4 Montgomery Av.
1920 Diehl, Harold Edgar......Quincy. 25 Greenleaf St.
1910 Dillon Michael John. Jr....Springfield. 1054 State St.
1917 Dillon, William Joseph....Springfield. 700 State St.
1917 DiMento, Vincent James...Boston. 349 Hanover St.
1894 Dion, Thomas Joseph......West Quincy (Quincy). 59 Cross St.
1912 Disbrow, Edward Perry....Worcester. 44 Hollywood St.
1901 Dix, George Alfred........Worcester. 105 Pleasant St.
1871 Dixon, Lewis Seaver.......Boston. 232 Clarendon St.
1881 Dixon, Robert Brewer.....Boston. 232 Clarendon St.
1881 1917 Doble, Ernest Edgar....Quincy. 150 Cross St.
1911 Dobson, William Marshall..Roxbury (Boston). 74 Fenwood Road.
1896 Dodd, Isaac Spencer Finney Pittsfield. 24 North St.
1912 Dodd, John Edward.......Framingham. 49 Franklin St
1900 Dodge, Arthur Malcolm....Boston. 483 Beacon St.
1907 Dodge, George Francis.....Athol. 1302 Main St.
1920 Dodge, Percy Lorraine....Allston (Boston) 1141 Commonwealth Av.
1886 Dodge, William Wooldredge.Boston. 1074 Boylston St.
1882 Doggett, Frederic Fobes....South Boston (Boston). †1919 805 Broadway.
1916 Doherty, Francis Joseph..Brighton (Boston). 71 Chestnut Hill Av. Office, Boston. 479 Beacon St.
1885 Dolan, William Andrew....Fall River. 546 South Main St.
1915 Dolan, William Edward...Worcester. 340 Main St.
1915 Dolan, William Francis.... Brookline. Office, Boston. 430 Marlboro' St.
1892 1920 Dole, Mary Phylinda.....Northampton. 57 Prospect St.
1889 Donahue, Hugh............Haverhill. 19 White St.
1895 Donahue, William Francis.Cambridge. 2294 Mass. Av.
1903 Donaldson, James Frank...Salem. 32 Lynde St.
1908 Donnell, Herbert Anthony.Medford. Office, Boston. 536 Commonwealth Av.
1885 Donoghue, Daniel Francis..Holyoke. 131 Chestnut St.
1894 Donoghue, Francis Dennis..Boston. 864 Beacon St.
1904 Donoghue, John Joseph....Worcester. 10 Vernon St.
1908 Donohue, Jeremiah Joseph.Worcester. 31 Trumbull St.
1887 1904 Donovan, Michael Ricard. Lynn. 101 North Common St.
1915 Donovan, Sylvester Edward New Bedford. 8 Wing St.
1911 Donovan, Thomas Roche...Fitchburg. 42 Fox St.
1910 Doonan, Henry Edward...South Hadley Falls. (South Hadley).
1916 Doray, Frank Leslie.......Worcester. 4 Normal St.
1880 Dorcey, James Edmund....Boston. 172 Harrison Av.
1900 Dorgan, Joseph Aloysius Lawrence. 477 Essex St.
1909 Dorion, Kinton François..Lawrence. 99 Bradford St.
1885 Dorr, Charles Alonzo †1920 Hingham. 304 Main St.
1901 Doucett, Frederick Luke...East Weymouth (Weymouth).
1905 Douglas, Archibald John...Westfield. 93 Elm St.
1899 Dow, David Crooker.......Cambridge. 6 Hilliard St.
1911 Dow, Frank Edward.......Northampton. 16 Center St.
1897 Dow, George Farwell. ....Reading. 20 Woburn St.
1882 Dow, George William......Lawrence. 64 Saunders St.
1871 Dow, James Arthur †1913 Belmont. Payson Rd.
1914 Dowling, John Joseph......Boston. City Hospital.
1895 Downey, Charles John.....Springfield. 317 Main St.
1908 Downey, Henry Arthur....Mittineague (West Springfield). 388 Westfield St.
1906 Downing, Andrew Francis..Cambridge. 335 Huron Av.
1897 Downing, Franklin Chace..Stockbridge. East Main St.
1919 Downing, John Godwin...Boston. 788 Beacon St.
1920 Doyle, John Henry........Fall River. 228 North Main St.
1909 Drake, Richard Alvin......West Medford (Medford). 6 Irving St.
1919 Drake, Wallace Horne.....North Weymouth.
1883 Drake, William Abram.....North Weymouth (Weymouth).
1901 Draper, Alexis Lumb......Dorchester (Boston). 1107 Washington St.
1885 Drew, Charles Aaron......Worcester. City Hospital.
1904 Drew, Frederick Prescott..East Dedham (Dedham).
1895 Drew, Maria Emma........Atlantic (Quincy). 39 Newbury Av.
1902 Dreyfus, Edna Weil.......Brookline. 30 Amory St.
1917 Driscoll, DeCourcey John..Springfield. 748 State St.
1897 Drohan, James Henry......Brockton. 204 Main St.
1888 Drummey, Nicholas Daniel.Dorchester (Boston). 533 Washington St.
1904 Drury, Dana Warren......Boston. 483 Beacon St.
1915 Drury, John Nelson.......Lowell. 275 Foster St.
1920 Dubins, Joseph Arthur....Salem. Salem Hospital
1906 Dubois, Eoline Church.....Springfield. 2 Temple St.
1917 Ducharme, Alphonse Napoleon Worcester. 20 Hamilton St.
1901 Duckering, Florence West..Boston. 520 Beacon St.
1900 Duckering, William West...Dorchester (Boston). 158 Harvard St.
1908 Ducy, William Dwyer......Brockton. 20 Cottage St.
1894 Dudley, Augustus William..Cambridge. 1740 Mass. Av.
1891 Duff, John................Charlestown (Boston). 5 Dexter Row.
1916 Duff, John, Jr.............Charlestown. (Boston). 5 Dexter Row.
1919 Duffy, James Joseph......Cambridge. N. Y. Mary McClellan Hosp.
1886 Duggan, John Thomas.....Worcester. 226 Southbridge St.
1906 Dunbar, Francis Herbert..Mansfield. P. O. address Boston. 46 Cornhill.
1893 Dunbar, Frank Collins.....Roxbury (Boston). 9 Beethoven St.
1914 Dunham, Adeline Frances..Cambridge. 881 Mass. Av.
1894 Dunham, Henry Bristol....Belleville, N. J. Essex Co. Sanitarium
1903 Dunn, Charles Hunter.... Boston. 178 Marlboro' St.
1894 Dunn, Charles Stein.......Haverhill. 133 Main St.
1920 Dunn, John Henry........Rockland. 873 North Union St.
1913 Dunn, William Ambrose....Boston. 154 Richmond St.
1885 Durant, Charles Edwin....Haverhill. 105 Emerson St.
1879 Durell, Thomas Moulton...Somerville. 131 Highland Av.
1866 Durgin, Samuel Holmes †1916 Duxbury. Tremont St.
1920 Durrie, Anna Belle........Arlington Heights (Arlington). Ring Sanatorium
1919 Dushan, Samuel Sidney...Dorchester (Boston). 1222 Blue Hill Av.
1867 Dutton, Charles †1917 Wakefield. 33 Avon St.
1916 Dutton, Frank Kingsley...Springfield. 10 Chestnut St.
1902 Dutton, Richard...........Wakefield. 33 Avon St.
1920 Duval, Leon Emile........East Gardner (Gardner). State Colony.
1919 Du Vally, Nicholas.........Boston. 57 Cambridge St.
1890 Dwight, Edwin Welles.....Boston. 87 Milk St., Room 46
1890 Dwyer, John Edward......Cambridge. 878 Mass. Av.
1911 Dwyer, John Edward, Jr.. Springfield. 35 Colonial Av.
1905 Dwyer, William Joseph....Boston. 514 Commonwealth Ave.
1882 1904 Dyer, Ebenezer Alden... Whitman. 506 Washington St.

## E

1912 Earle, George Henry.......Boston. 1138 Boylston St.
1916 Easter, Edna Frances.....Arlington. 16 Linwood St.

1901 Eastman, Alexander Crane. Springfield. 6 Chestnut St.
1906 Eastman, Theodore Jewett South Berwick, Me. Office, Boston. 71 Marlboro' St.
1900 Easton, Elwood Tracy..... Boston. 209 Newbury St.
1915 Eaton, Harold Burney..... Boston. 222 Marlboro' St.
1914 Eaton, Henry Douglas...., Ridgefield. Conn.
1866 Eddy, George Stetson †1909.. Newton. 73 Sargent St.
1917 Edelstein, Samuel ........ Roxbury (Boston). 31 Gaston St.
1861 Edes, Robert Thaxter †1912 Springfield. 251 Rimmon Av.
1920 Edmunds, Fred Andrew... Shelburne Falls (Shelburne). 45 Bridge St.
1913 Edsall, David Linn........ Cambridge. Office, Boston. 52 Blossom St.
1867 Edson, Ptolemy O'Meara †1904 Roxbury (Boston). 36 Elm Hill Av.
1894 Edwards, William Lothrop. Boston. 33 Gloucester St.
1897 Egan, John Joseph......... Gloucester. 23 Dale Av.
1906 Ehrenfried, Albert......... Brookline. Office. Boston. 21 Bay State Rd.
1887 Ehrlich, Henry............ Boston. 172 Commonwealth Av.
1915 Eidam, Carl Hermann..... Lawrence. 334 Prospect St.
1913 Eisner, Maurice Soloman... Pittsfield. 86 North St.
1874 Ela, Walter †1914 Cambridge. 13 Ash St.
1907 Elder, Fred Orestes........ Wakefield. 22 Chestnut St.
1885 Eldridge, David Gorham... Dorchester (Boston). 15 Monadnock St.
1916 Elkind, Henry Byron ..... Worcester. 126 Franklin St.
1906 Ellam, Herbert William.... Gardner. 29 Parker St.
1914 Eliot, Henry Whitney...... Manchester, Vt.
1920 Eliot, Martha May........ New Haven, Conn.
1900 Elliot, Henry Libbey....... Salem. 84 Washington Sq.
1877 Elliot, John Wheelock..... Boston. 124 Beacon St.
1903 Elliott, Alfred............. Middleborough. 4 Rock St.
1873 Elliott, Russell Dunson.... Boston. 9 Dwight St.
1908 Ellis, Arthur Henry........ Greenfield. 28 Federal St.
1905 Ellis, Edward Keith....... Hyde Park (Boston). Office, Boston. 232 Clarendon St
1880 Ellis, Frederic Warren..... Monson. Oak St.
1873 Ellis, George Livingstone †1913 Middleborough. 135 Center St.
1919 Ellis, Ralph Warner...... Worcester. 574 Main St.
1915 Ellison, Daniel James...... Lowell. 292 Princeton St
1894 } 1916 } Ellison, George Washington } Spencer. 158 Main St.
1899 Ellsworth, Samuel Walker. Quincy. Office. Boston. 520 Beacon St.
1899 Ely, Richard Skinner...... West Townsend (Townsend).
1913 Ely, Theodore Williams.... Dorchester (Boston). 329 Talbot Av.
1918 Emard, George Adelbert... Mansfield. 89 No. Main St.
1903 Emerson, Benjamin Kendall Worcester. 37 Pearl St.
1873 Emerson, Edward Waldo... †1917 Concord. Lowell Road.
1899 Emerson, Ernest Benjamin Rutland.
1893 Emerson, Francis Patten... Brookline. Office, Boston. 520 Commonwealth Av.
1917 Emerson, Frederick Lincoln Boston. 445 Marlboro' St.
1903 Emerson, George Edward.. South Weymouth (Weymouth). Office, Boston. 543 Boylston St.
1893 Emerson, Herbert Clark.... Springfield. 83 Maple St.
1911 Emerson, Nathaniel Waldo Jamaica Plain (Boston). 118 Forest Hills St.
1916 Emerson, Paul Waldo..... Boston. 86 Bay State Road.
1900 Emerson, William Roble Patten Boston. 657 Boylston St.
1900 Emery, George Edwin...... Worcester. 280 Lincoln St.
1909 Emery, William Campbell.. Dorchester (Boston). 430 Columbia Road.
1870 Emery, William Henry.... Roxbury (Boston). 109 Warwick St.
1915 Emmons, Henry Manning.. Jamaica Plain (Boston). Office, Boston. 320 Commonwealth Av.
1896 } 1919 } Enebuske, Claës Julius. { Cambridge. Office, Boston. 419 Boylston St.
1904 England, Albert Charles... Pittsfield. 124 North St.
1912 English, Martin Joseph.... Boston. 514 Commonwealth Av.
1888 Ensworth, William Howard. East Boston (Boston). 40 Princeton St.
1894 Erb, Theodore Charles..... Boston. 394 Marlboro' St.
1881 Ernst, Harold Clarence.... Jamaica Plain (Boston). Office, Roxbury (Boston). 240 Longwood Av.
1899 Estabrook, Charles Taylor.. Worcester. 390 Main St.
1912 Eustis, Richard Spelman... Boston. 355 Marlboro' St.
1903 Evans, Albert............. Boston. 409 Marlboro' St.
1904 Evans, Miner Harlow Amos, Jr. Dorchester (Boston). Office, Boston. 248 Newbury St.
1908 Eveleth, Samnel Chester... Marblehead. 137 Washington St.
1899 Everett, Eugene Ellsworth. Boston. 427 Marlboro' St.
1905 Everett, Frederick Luther.. Springfield. 10 Chestnut St.
1880 Everett, Oliver Hurd...... Worcester. 53 Pearl St.
1865 Everett, Willard Shepard †1905 Newton Upper Falls (Newton). 20 Summer St.
1900 Ewing, George Winburn... Middleton. Office, Peabody. 32 Main St.

## F

1906 Fabyan, Marshal........... Boston. 379 Commonwealth Av.
1899 Fair, John Francis........ Cambridge. 390 Cambridge St.
1901 Fair, Robert Patrick....... Boston. 481 Beacon St.
1897 Fales, Alonzo Cartland.... Middleton, N. S.
1920 Fallon, Joseph David...... Northampton. 42 Pleasant St.
1912 Fallon, Joseph Francis..... Brookline. 495 Boylston St.
1891 Fallon, Michael Francis.... Worcester. 390 Main St.
1880 Farlow, John Woodford.... Boston. 127 Bay State Road.
1895 Farnham, John Marshall Willoughby Worcester. 28 Pleasant St.
1908 Farr, Irvin Harris......... Holyoke. 179 Chestnut St.
1915 Farrar, Lonnie Oliver..... State Farm (Bridgewater).
1894 Farrington, Leander Morton Manchester, N. H. 267 River Road
1893 Faulkner, Herbert Kimball. Keene, N. H. 78 West St.
1891 Faulkner, William Edward. Boston. 290 Marlboro' St.
1905 Faunce, Calvin Barstow, Jr. Jamaica Plain (Boston). Office, Boston. 320 Commonwealth Av.
1905 Faxon, Eudora Winifred... Arlington H't's (Arlington). 10 Hillside Av.
1907 Faxon, Nathaniel Wales... Boston. Mass. Gen. Hosp.
1907 Faxon, William Otis....... Stoughton. 4 Walnut Av.
1897 Fay, Frank Gleason........ Worcester. 390 Main St.
1875 Fay, James Monroe....... Northampton. 25 Summer St.
1911 Fay, Joseph Henry........ Melrose. 36 West Emerson St.
1888 Fay, William Eastman..... Brookline. Office, Boston. 366 Commonwealth Av.
1904 Feeley, Charles Philip..... Cambridge. 1039 Mass. Av.
1914 Feeley, Walter Clarence.... Cambridge. 885 Mass. Av.
1919 Fein, Harry............... Roxbury (Boston). 24 Seaver St.
1906 Felch, Carrie Innes....... Boston 1069 Boylston St.
1913 Felch, George Alfred....... Allston (Boston) 1377 Commonwealth Av.
1906 Felch, Lewis Perley....... Boston 1069 Boylston St.
1918 Feldman, Aaron.......... Boston. 17 Allen St.
1919 Feldman, Louis............ Boston. 1 Allen St.
1912 Fennelly, Daniel John..... Fall River. 276 Winter St.

1903 Fennessey, John Francis...Dorchester (Boston). 15 Adams St.
1915 Fenton, Alfred Archibald..Norwood. 17 Walpole St.
1905 Fenwick, George Benson...Chelsea. 24 Gardner St.
1900 1916 Ferguson, Edward Hugh. Dorchester (Boston). 60 Charles St.
1901 Ferguson, Robert Henry...East Orange, N. J. 9 North Munn Av.
1903 Fernald, Guy Goodwin.....Concord Junction (Concord). Assabet Av.
1895 Fernald, Walter Elmore....Waverley (Belmont). P. O. Box 344.
1904 Ferrin, William Warren...Haverhill. 191 Merrimack St.
1919 Fessenden, Charles Hill...Newton Center (Newton). 34 Pelham St.
1906 Field, Henry Martyn.......Norwood. 784 Washington St.
1904 Field, Martin Thomas......Salem. 23 Winter St.
1920 Finch, Edward Bronson...Greenfield. 191 Main St.
1900 Finch, George Hardy.......Springfield. 310 Main St.
1919 Finck, Harry Paul........Boston. 68 Bay State Rd.
1904 Finkelstein, Harry.........Boston. 342 Hanover St.
1919 Finkelstein, Isadore Albert.Dorchester (Boston). 1095 Blue Hill Av.
1912 Finkelstein, Nathan........Pittsfield. 184 North St.
1911 Finlayson, Alan Daniel....Cleveland, Ohio 2677 E. 128th St.
1890 Finn, Edward William.....Dedham. 5 Franklin Sq.
1913 Finnegan, Francis Augustine Worcester. Park Bldg.
1913 Finnegan, Philip Joseph...Salem. 92½ Essex St.
1914 Finnerty, Charles William.W. Somerville (Somerville) 54 Bristol Road.
1884 Finnigan, Patrick Joseph..Cambridge. 1412 Cambridge St.
1919 Fipphen, Clarence Wyman.Shrewsbury. Grafton St.
1904 Fischbein, Louis...........Dorchester (Boston). Office, Boston. 366 Commonwealth Av.
1897 Fish, Ernest Clifford.......Melrose. 11 Wyoming Av.
1897 Fish, John Euclid.........Canton. Mass. Hospital School.
1904 Fish, Louis................Fitchburg. 86 Day St.
1902 1919 Fish, Ralph Charles.....Worcester. 772 Main St.
1920 Fisher, Edgar Alexander..Worcester. 25 Elm St.
1873 Fisher, Chester Irving †1916 New York City, N. Y. 1925 7th Av.
1902 Fisher, Irving Jewell......West Newton (Newton). 79 Chestnut St.
1919 Fisher, John Charles Vincent Dorchester (Boston). 640 Columbia Rd.
1910 Fishman, Maurice..........Lowell. 33 Canton St.
1888 Fisk, Arthur Lyman.......New York City, N. Y. 41 West 50th St
1886 Fiske, Eustace Lincoln.....Fitchburg. 20 Prichard St.
1920 Fitts, Henry Bird.........Southbridge.
1913 Fitz, Reginald.............Roxbury (Boston). P. B. Brigham Hospital.
1898 Fitzgerald, Clara Pauline..Worcester. 137 Pleasant St.
1920 Fitzgerald, Edmund Boyd.Quincy, 23 Bridge St.
1892 Fitzgerald, James Bernard.Boston. 393 Mass. Av.
1906 Fitzgerald, John Joseph...Haverhill. 111 Emerson St
1903 Fitzpatrick, John Joseph...Charlestown (Boston). 50 High St.
1910 Fitz-Simmons, Henry Joseph Jamaica Plain (Boston). Office, Boston. 520 Beacon St.
1902 Flagg, Elisha..............Boston. 199 Commonwealth Av.
1909 Flagg, Harry Howard......Charlestown (Boston). 30 Elm St.
1913 Flaherty, Edward James..Maynard. 44 Main St.
1914 Fleet, William Ernest......Cambridge. 9 Columbia St.
1914 Fleming, Edward Rahn....Medford. 322 Boston Av.
1904 Fleming, Patrick Joseph...Cambridge. 236 Huron Av.
1903 Fleming, Peter Joseph.....Mattapan (Boston). 1258 Blue Hill Av

1902 1909 Fletcher, Robert Swan....Oxford. Charlton St.
1893 Fletcher, Robert Whitney..South Boston (Boston). 783 Broadway.
1905 Flett, Penelope McNaughton Framingham. Box 99.
1920 Fleury, Oswald Theodore..Boston. City Hospital.
1882 Flood, Everett †1920 Palmer. Monson State Hospital.
1910 Flournoy, Thomas.........Pittsfield. 17 East Housatonic St.
1905 Floyd, Cleaveland..........Boston. 246 Marlboro' St.
1893 Flynn, John Joseph........Pittsfield. 183 North St.
1902 Flynn, John Joseph........Worcester. 10 Grand St.
1916 Fobes, Howard Edward...Brockton. 63 Main St.
1883 Fogerty, William Clemmons.Worcester. 98 Chandler St.
1880 Fogg, Irving Sylvester †1918 Norwood. 767 Washington St.
1919 Foley, John Arthur........Boston. 514 Commonwealth Av.
1913 1921 Foley, Thomas Brinsley..Boston. 85 Westland Av.
1894 Foley, Timothy John.......Worcester. 340 Main St.
1917 Foot, Nathan Chandler....Milton. Canton Av.
1910 Forbes, Alexander.........Milton. Harland St.
1893 Ford, John Francis........Roslindale (Boston). 8 Walter St.
1919 Forsley, Thomas, Jr.......Lowell. 126 Central St.
1914 Forster, John Ferguson Cooke Holyoke. 276 High St.
1901 Forster, Robert William...Lawrence. 279 Broadway.
1895 Fosgate, Elmer Gilman....Ashburnham.
1914 Foss, George Herbert......Springfield. 10 Chestnut St.
1909 Foss, Ralph Emery........Peabody. 97 Main St.
1916 Foster, Arthur Neville....Dorchester (Boston). 740 Adams St.
1884 Foster, Charles Chauncy...Cambridge. 8 Elmwood Av.
1883 Foster, Horace Kendall....Peabody. 2 Park St.
1907 Fowler, John Richard.....Spencer. 142 Main St.
1911 Fox, Michael Bernard......Worcester. 6 Coral St.
1887 Fox, William Yale.........Taunton. 26 Second St.
1915 Fraim, Irving William....Waltham. 822 Main St.
1894 Frame, Joseph.............Rockland. 144 Webster St.
1891 Francis, Carleton Shurtleff.Brookline. 26 Davis Av.
1887 Francis, George Hills......Brookline. 295 Walnut St.
1911 Frank, Morris.............Roxbury (Boston). 152 Humboldt Av.
1917 Frankel, David Israel......Boston. Mass. Hom. Hosp.
1902 Franz, Adolph.............Holyoke. 266 Maple St.
1911 Fraser, Archibald McKay..Boston. 69 Newbury St.
1880 Fraser, John Chisholm.....East Weymouth. (Weymouth).
1915 Fraser, Somers............Boston. 514 Commonwealth Av.
1913 Fraser, William Leslie.....Lynn. 812 Summer St.
1915 Frasier, Joseph Anthony...New Bedford. 265 Union St.
1911 Frawley, William Thomas..Pittsfield. 184 North St.
1905 Freedman, Louis Mark.... Brookline. Office, Boston. 419 Boylston St.
1894 Freeman, Franklin Willard..Lynnfield Center (Lynnfield). P. O. Wakefield, R. F. D.
1916 Fregau, Aime Napoleon...Fitchburg. 44 Prichard St.
1919 Freligh, Claude Adelbert...Palmer. 431 Main St.
1919 Fremont-Smith, Frank.....Boston. 186 Commonwealth Av.
1920 Fremont-Smith, Maurice...Boston. 186 Commonwealth Av.
1900 French, Charles Ephraim..Lowell. 60 Holyrood Av.
1887 French, Charles Lindol....Clinton. 271 High St.
1892 French, John Marshall.....Milford. 2 South Main St.
1920 French, Leland Malcolm...Worcester. 24 Russell St.
1911 French, Ralph Winward...Fall River. 151 Rock St.
1920 Fried, Anton Ranseen....Newtonville (Newton). 324 Walnut St.
1914 Friedman, Benjamin.......Boston. 35 Allen St.
1916 Friedman, Eli.............Boston. 366 Commonwealth Av.
1920 Friedman, Harry Falk.....Boston. 69 Newbury St.
1901 Friedman, Leo Victor......Newton Center (Newton). Office, Boston. 425 Marlboro' St.

1910 Friedman, Nathan.........Boston. 1069 Washington St.
1920 Frost, Harold Maurice....Boston. 233 Charles St.
1906 Frothingham, Channing, Boston. 721 Huntington Av.
1919 Fryburg, Charles August..Worcester. 17 Reeves St.
1909 Fuller, Andrew Howard....Fiskdale (Sturbridge). Main St.
1903 Fuller, Charles Benjamin..Waltham. 781 Main St.
1890 Fuller, Daniel Hunt.......Philadelphia, Pa. 49th and Market Sts.
1907 Fuller, Ernest Page....... Lawrence. 301 Essex St.
1894 Fuller, Frederick Henry....Walpole.
1892 Fuller, James Robert......Andover. 68 Central St.
1915 Fuller, Solomon Carter.... Framingham. Office, Boston. 220 Clarendon St.
1898 Fullerton, Walter Wilson..Brockton. 106 Main St.
1911 Funnell, Wilfred Goldwin..Wollaston (Quincy). Office, Boston. 543 Boylston St.

## G

1905 Gabler, George Lewis......Holyoke. 149 Chestnut St.
1917 Gaetani, Arthur Leonard..Dorchester (Boston). 23 East St.
1908 / 1920 Gaffney, Mary Evangeline. Rutland. State Sanatorium.
1905 Gafney, Harry Dabol......Ware. 45 Main St.
1906 Gage, Fred Leon..........Lowell. 202 Gibson St.
1886 Gage, Homer..............Worcester. 72 Pearl St.
1884 Gage, James Arthur.......Tyngsborough. Office, Lowell. 18 Shattuck St.
1907 Gahan, Patrick Francis....Medford. 19 Washington St.
1891 Gale, George Washington...East Saugus (Saugus). †1904 68 Lincoln Av.
1901 Gale, Harold Adams.......Winchester. Office, Boston. 111 Newbury St.
1906 Gallagher, John Henry Connaughton Chicopee. 105 Center St.
1912 Gallagher, Nicholas Ambrose Malden. 458 Pleasant St.
1907 Gallagher, Thomas Morton.Newton. 34 Channing St.
1906 Galligan, Edward Joseph...Taunton. 10 North Pleasant St.
1882 Galligan, Eugene Thomas..Roxbury (Boston). 84 Warren St.
1910 Gallison, James Murry.....Brookline. Office, Boston. 520 Commonwealth Ave.
1893 Gallivan, William Joseph..South Boston (Boston). 743 Broadway.
1919 Gallupe, Harold Quimby..Boston. 728 Commonwealth Av.
1904 Galvin, Augustus Hughes..Anaheim, Calif. 117 Claudina St.
1901 Galvin, William...........Blackinton (Williamstown).
1919 Gangemi, Michael Angelo..North Adams. 44 Ashland St.
1920 Ganley, Edward Henry....Methuen. 99 Lowell St.
1887 Gannett, William Whitworth Boston. 274 Marlboro' St.
1917 Garbelnick, David Abraham Haverhill. 4 Observatory Av.
1903 Gardner, Archibald Robert .Lowell. 18 Shattuck St.
1881 Gardner, Clarence Rhodolphus †1916 Northampton. 78 Main St.
1912 Gardner, Edwin Daniels...New Bedford. 150 Cottage St.
1900 Gardner, Harrie Milton....Cambridge. 128 Magazine St.
1919 Garfield, Walter Thompson.Cambridge. Office, Boston. 45 Bay State Rd.
1913 Garipay, Ellsworth Peter..Lynn. 554 Western Av.
1875 Garland, Albert Stone †1908 Gloucester. 18 Pleasant St.
1916 Garland, Frederick Eugene Wellesley Hills. Office, Boston. 483 Beacon St.
1874 Garland, George Minot.....Boston. 227 Newbury St.
1920 Garland, Joseph...........Boston. Mass. Gen. Hosp.
1905 Garland, Roy..............Gloucester. 17 Pleasant St.
1917 Garrett, Frank Steele......Chelsea. 242 Washington Av.
1917 Garrick, Nathan Henry...Boston. 416 Marlboro' St.
1895 Gates, Ernest A...........Springfield. 49 North Main St.
1899 Gavin, John Harrison..... Roxbury (Boston). 198 Warren St.
1905 Gay, Clarence Bertram.... Fitchburg. 62 Day St.
1903 Gay, Fritz Walter.........Malden. 105 Salem St.
1868 Gay, George Washington...Chestnut Hill (Newton). Office, Boston. 665 Boylston St.
1917 Gay, William Madison....Washington, D. C. 1337 Columbia Rd.
1914 Gaylord, James Frederick..Springfield. 789 State St.
1918 Généreux, Edmond Alfred.Webster.
1902 Généreux, Joseph Olivier...Webster. 32 Main St.
1916 Gennert, Jacob............New Bedford. 1133 Acushnet Av.
1907 George, Arial Wellington..Boston. 43 Bay State Rd.
1897 George, Arthur Phillips....Haverhill. 143 Main St.
1908 George, Frank William....Worcester. 6 High St.
1908 George, Leslie Handlin.....Bradford (Haverhill). 70 Main St.
1911 Gerber, Isaac..............Providence, R. I. 201 Waterman St.
1901 Germain, Harry Homer....Boston. 43 Bay State Rd.
1882 Gerould, Joseph Bowditch..North Attleborough. 34 High St.
1919 Gerrard, Clarence Charles.Springfield. 1371½ State St.
1896 / 1913 Gerstein, Maurice.......Roxbury (Boston). 466 Warren St.
1915 Gervais, Harriet Marion...Brooklyn, N. Y. 191 Ryerson St.
1885 Getchell, Albert Colby.....Worcester. 6 Linden St.
1912 Ghoreyeh, Albert Alphonso Wood Jaffa, Palestine.
1883 Gibbs, Locero Jackson.....Chicopee Falls (Chicopee). †1915 33 Broadway.
1917 Gibby, Harold James......Worcester. 13 Elm St.
1909 Giddings, Harold Girard...Allston (Boston). Office, Boston. 520 Commonwealth Av.
1908 Giguere, Alfred Joseph....Lowell. 777 Merrimack St.
1887 Gilbert, John †1916 Fall River. 254 Locust St.
1915 Gilchrist, John Milton.....Springfield. 106 Chestnut St.
1906 Gile, Frank Herbert, Jr....Braintree. 420 Washington St.
1892 Gile, John Morton.........Hanover, N. H. 1 Maynard St.
1914 Gilfillan, Donald Robert...Worcester. State Hospital.
1919 Gillespie, Norman Wilkinson Dorchester (Boston). 632 Columbia Rd.
1905 Gillis, John Ewen.........West Somerville (Somerville). 1109 Broadway.
1906 Gilman, Charles Sleeper... Lakeport, N. H. 743 Union St.
1909 Gilman, Florence..........Northampton. 33 Elm St.
1920 Gilman, William Henry....Cambridge. 151 Austin St.
1906 Gilpatrick, Roy Hawkes....Boston. 19 Bay State Rd.
1906 Giroux, Charles............Three Rivers (Palmer).
1906 Glass, James..............Framingham. 40 Union Av.
1919 Gleason, Benjamin Whitney Athol. 137 Main St.
9120 Gleason, Mardis Edward...Newtonville (Newton). 125 Vernon St.
1896 Glendenning, Robert Thompson Manchester. 8 Church St.
1915 Glidden, Edson William, Jr. Alto, Ga. State Sanatorium.
1912 Glunts, David.............Roxbury (Boston). 165 Harold St.
1919 Goddard, Fred Chambers..Worcester. 925 Main St.
1906 Goddard, Samuel Warren..Brockton. 129 West Elm St.
1905 Goddu, Louis Adalore Oliver Boston. 510 Commonwealth Av.
1914 Godfrey, Henry White.....Auburndale (Newton). 14 Hancock St.

1901 Godfrey, Joseph Witter....Swampscott. Office, Lynn. 26 Broad St.
1919 Godvin, Bernard Aloysius..Jamaica Plain (Boston). 105 Sedgwick St.
1919 Goethals, Thomas Rodman.Boston. 205 Beacon St.
1900 Golden, Lazarus..........Boston. 99 Green St.
1920 Golden, Ross.............Boston. Mass. Gen. Hosp.
1919 Goldman, Harry..........Roxbury (Boston). 421 Warren St.
1906 Goldsbury, Paul Williams..Deerfield.
1888 Goldthwait, Joel Ernest....Boston. 372 Marlboro' St.
1916 Golub, Jacob Joshua......Brookline. Office, Boston. U. S. Immigration Sta., Long Wharf.
1906 Good, Frederick Leo.......Allston (Boston). Office, Boston. 64 Commonwealth Av.
1892 Goodale, Joseph Lincoln...Boston. 258 Beacon St.
1904 Goodall, Harry Winfred...Boston. 205 Beacon St.
1881 Goodell, George Zina......Salem. 5 Williams St.
1906 Goodell, William..........Springfield. 6 Chestnut St.
1890 Goodman, Samuel.........Roxbury (Boston). 148 Townsend St.
1902 Goodridge, Frederick James Cambridge. 5 Appian Way
1920 Goodwin, Harold Merle....Boston. 430 Marlboro' St.
1892 Goodwin, James Joseph....Clinton. 202 Church St.
1910 1918 } Gookin, Edward Richard. { Dorchester (Boston). 801 Columbia Road.
1919 Gordon, John Hurter......Detroit, Mich. 5115 McKinley Av.
1917 Gordon, Samuel Finley...Philadelphia, Pa. 1326 Rockland St.
1896 Gordon, Stephen Masury...Fall River. 512 High St.
1905 1910 } Gorham, George Hartley { West Roxbury (Boston). 81 Corey St.
1915 Gosline, Harold Inman.....Howard, R. I. State Hospital.
1896 Goss, Arthur Vincent......Taunton. State Hospital.
1869 Goss, Francis Webster.....Sacramento, Calif. 1034 40th. St.
1916 Gould, Carlisle Royal.....Salem. 208 Lafayette St.
1899 Grady, Patrick Anthony Salmon Clinton. 104 School St.
1915 Grady, Thomas Henry.....Clinton. 76 Walnut St.
1873 Graham, Douglas..........Brookline. Office, Boston. Hotel Brunswick
1911 Grainger, Edward John....Winthrop. 49 Bartlett Rd.
1882 Grainger, William Henry..East Boston (Boston). †1916 108 Meridian St.
1919 Grandison, Louis Julian...Somerville. 321 Broadway.
1901 Grandison, Wilfred George.Charlestown (Boston). 65 High St.
1903 Granger, Frank Butler....Boston. 520 Commonwealth Av.
1882 Granger, Frank Clark......Randolph. 15 Union St.
1893 Granger, Karle Henry.....South Weymouth (Weymouth).
1919 Grant, Justin Frank.......Boston. 592 Tremont St.
1896 Grant, William Herbert....Allston (Boston). Office, Boston. 520 Commonwealth Av.
1904 Grant, William Victor.....Lawrence. 253 Essex St.
1916 Grant, Winifred Margaret.Worcester. 765 Main St.
1905 Graves, Benjamin Augustus Dorchester (Boston). 178 Bowdoin St.
1904 Graves, Robert John.......Concord, N. H. 3 North State St.
1901 Graves, William Phillips...Boston. 244 Marlboro' St.
1901 Gray, Alice Maud.........Roxbury (Boston). 149 Warren St.
1896 Gray, Elizabeth Taylor....Roxbury (Boston). 149 Warren St.
1891 Gray, George Henry.......Lynn. 11 Shore Drive.
1915 Gray, Horace............Boston. 32 The Fenway.
1903 1906 } Gray, Hugh Barr........Boston. 41 Waltham St.
1916 Greany, William Francis..Holyoke. 644 Dwight St.
1914 Greeley, Hugh Payne......Madison, Wis. 112 No. Hamilton St.
1877 Green, Charles Montraville.Boston. 78 Marlboro' St.
1919 Green, Hyman.............Boston. 483 Beacon St.
1868 Green, John Orne †1912 Boston. 267 Newbury St.
1917 Green, Milo Chester......Boston. 19 Bay State Rd.
1906 Green, Robert Montraville..Boston. 496 Commonwealth Ave.
1919 Greenberg, Boris Efin.....Roxbury (Boston). 538 Warren St.
1901 Greene, Daniel Crosby, Jr..(Boston). 23 Bay State Rd.
1915 Greene, Edward Chace....East Norfolk (Norfolk).
1887 Greene, Edward Miller.....Boston. 45 Chestnut St.
1915 Greene, Jeremiah AugustineCambridge. 2203 Mass. Av.
1904 Greene, Ransom Alphonso..Hathorne.
1887 Greene, Ray Woodville.....Worcester. 21 West St.
1895 Greene, Thomas Francis...Roxbury (Boston). 322 Warren St.
1896 Greene, William Henry....Roxbury (Boston). 322 Warren St.
1900 Greenough, Clara Mary....Cheney, Wash. Box 1003.
1898 Greenough, Robert Battey..Boston. 8 Marlboro' St.
1888 Greenwood, Allen..........Wellesley Hills. Office, Boston. 101 Newbury St.
1905 Greenwood, Arthur Moses..Newtonville (Newton). 369 Walnut St.
1881 Greenwood, Sewell Elliot..Templeton. †1919
1907 Gregg, Donald.............Wellesley. 113 Wellesley Av.
1884 Griffin, Arthur George.....Malden. 195 Pleasant St.
1903 Griffin, Walter Alden......Sharon. Main St.
1904 Grimes, Loring............Swampscott. 129 Burrill St.
1896 Griswold, Merton Lyman...Uxbridge. South Main St.
1915 Grocshinsky, Herman......New Bedford. 54 Russell St.
1916 Grogan, Margaret VictorineBoston. 483 Beacon St.
1893 Grouard, John Shackford..Nantucket.
1904 Grover, Arthur Leon...... Los Angeles, Calif. 1461 S. Grammercy Pl.
1914 Grover, Joseph Isaac......Mattapan (Boston). Office, Boston, 272 Newbury St.
1883 Gruver, Samuel James.. †1917 Brockton. 271 Crescent St.
1912 Guild, Bruno Thurber.....Dorchester (Boston). 43 Algonquin St.
1887 Guild, Edgar Hunt.........Springfield. 137½ State St.
1910 Guild, Edward Frank......Chelsea. 9 Crescent Av.
1909 Guild, Frederick Washburn.Grafton. South St.
1896 Guild, Thomas Ezra.......Mattapan (Boston). 1550 Blue Hill Av.
1916 Gunning, Thomas Francis.Fall River. 238 No. Main St.
1914 Gunter, Fred Clarke.......Boston. 483 Beacon St.
1918 Guralnick, Rubin..........East Boston (Boston). 44 Saratoga St.
1920 Gurjian, Leon Kevork.....Lynn. 526 Western Av.
1919 Gustafson, Paul...........Boston. City Hospital.
1913 Guthrie, Andrew Doherty..Medford. 408 Salem St.
1917 Guy, Walter Bryant......St. Augustine, Fla.
1914 Gwinnell, Alfred Weston...Allston (Boston). 1283 Commonwealth Av.
1914 Gwynne, Samuel Carlton...Address unknown.

## H

1911 Hagerty, Joseph James....Norwood. 699 Washington St.
1920 Haggart, Gilbert Edmund..Boston. Mass. Gen. Hosp.
1911 Haigh, Gilbert William....Worcester. 167 Lincoln St.
1900 Haines, Ignatius............Brookline. Office, Boston. 178 Devonshire St. Room 615.
1920 Haines, Samuel Faitoute..Boston. Mass. Gen. Hosp.
1914 Haley, William Thomas....Salem. Office, Boston. 531 Beacon St.
1915 Hall, Charles Francis Adams Newburyport. 210 High St.
1911 Hall, Gardner Wells.......Boston. 396 Marlboro' St.
1877 Hall, Harry Porter........Leominster. 70 West St.

1896 Hall, Herbert James.......Marblehead. Devereux Mansion.
1903 Hall, John Baptiste, Jr....Roxbury (Boston). 60 Windsor St.
1902 Hall, Walter Davis........Port Clyde, Me.
1885 Hall, William Dudley......Boston. 416 Marlboro' St.
1897 Hallett, Edward Bangs....Gloucester. 63 Middle St.
1906 Halligan, Edward Maurice.Reading. 18 Salem St.
1910 Hallisey, Joseph Edward...Dorchester (Boston). 467 Columbia Road.
1881 Halloran, Michael Joseph...Worcester. 42 Green St.
1890 Halpin, Andrew James.....Lowell. 4 Chester St.
1906 Halsall, Mary Elizabeth... East Boston (Boston). 163 Meridian St.
1916 Halton, Edward Peter.... Springfield. 387 Main St.
1912 Hamblen, Howard.........South Windham, Me. R. F. D.
1914 Hamblet, Mary Lucia......Wallum, R. I.
1908 Hamilton, Albert John Adams Boston. 69 Newbury St.
1899 Hamilton, Annie Lee.......Boston. 141 Newbury St.
1912 Hamilton, Burton Everett..West Roxbury (Boston) Office, Boston. 19 Bay State Rd.
1907, 1919 Hamilton, Frank Andrew.Boston. 22 Mt. Vernon St.
1905 Hamilton, Robert DeLancey Newburyport. 220 High St.
1906 Hammond, Charles.........Hanover. Washington St.
1920 Hammond, Harry Weymouth West Newton (Newton). 500 Crafts St.
1920 Hammond, John Wilkes, Jr. Cambridge. 337 Harvard St.
1893 Hammond, Philip..........Winchester. Office, Boston. 483 Beacon St.
1899 Hammond, William John...Newton Center (Newton). 50 Grafton St
1875 Hammond, William Penn..Charlestown (Boston). †1919 47 Monument Sq.
1914 Hampson, Nishan M.,......Dorchester (Boston). Office, Boston. 205 Beacon St.
1916 Hand, Edward Patrick Holyoke. 115 Suffolk St.
1911 Handy, Harrie Delmar.....Harwich. 18 Parallel St.
1899 Handy, Harry Tucker......Scituate Center.
1895 Hanley, Francis Joseph....Whitman. 21 Whitman Av.
1895, 1911 Hanley, John Joseph....Motherwell, Scotland. Southcroft.
1919 Hanlon, Joseph Peter......Hudson. 18 Pope St.
1919 Hanlon, Morgan Patrick...Cambridge. 65 Concord Av.
1914 Hanscom. Ridgely Fernald Dedham. 30 Highland St.
1901 Hanson, Justus Greeley....Northampton. 219 Elm St.
1905 Hanson, William Clinton..Belmont. 395 Belmont St.
1917 Hanson, William Greene..Everett. 27 Norwood St.
1907 Hanson, William Thomas..Tewksbury. State Infirmary.
1901 Hapgood, Lyman Sawin....Cambridge. 6 Garden St.
1920 Harding, Edward..........Boston. 155 Bay State Rd.
1890 Harding, George Franklin..Boston. 419 Boylston St.
1912 Hardwick, Everett Vinton.Dorchester (Boston). 43 Algonquin St.
1906 Hardwick, Sydney Curtis..Quincy. 159 Elm St.
1920 Hardy, Wilbert Clark......Haverhill. 92 Winter St.
1888 Hare, Charles Henry.......Boston. 483 Beacon St.
1901 Harkins, John Francis.....Worcester. 18 Franklin St
1915 Harkins, William Joseph, Jr.Quincy. 1174 Hancock St.
1890 Harlow, Corydon Webster..Melrose Highl'ds (Melrose). 300 Franklin St.
1908 Harmer, Torr Wagner.....Boston. 416 Marlboro' St.
1901 Harriman, Charles Henry..Whitinsville (Northbridge). Church St.
1903 Harriman, Cora Elizabeth..Framingham. 15 High St.
1902 Harriman, David Eugene..Springfield. 175 State St.
1920 Harriman, Frank Edwin...Worcester. 6 High St.
1903 Harriman, Perley..........Lynn. 290 Summer St.
1907 Harrington, Clifton Ward..Everett. 590 Broadway.
1912 Harrington, Daniel James..Dorchester (Boston). 975 Dorchester Av.
1884 Harrington, Harriet Louise. Dorchester (Boston). †1919 20 Monadnock St.
1903 Harrington, Michael William Indian Orchard (Springfield). Oak St.
1895 Harris, Arthur Eugene.....Lynn. 17 Chestnut St.
1898 Harris, Charles Edward....Hyannis (Barnstable). Main St.
1919 Harris, Francis Sterling...Cambridge. 154 Auburn St.
1915 Harris, Lorne Wilborne....Cliftondale (Saugus). 257 Lincoln Av.
1919 Harris, Walter Callahan...Worcester. 106 Millbury St.
1900 Harris, William DeBlois...Lynn. 98 South Common St.
1908 Harrison, Columbus William Boston. 35 Common St.
1884 Harrower, David....... Worcester. 13 Elm St.
1918 Hart, Francis Denbroeder..Worcester. 22 Pleasant St.
1896 Hart, George Fred.........Webster. 17 Church St.
1900 Hart, Henry Brown........Yarmouthport (Yarmouth).
1901 Hart, Joseph Storer........U. S. Army South Lincoln (Lincoln).
1906 Hartman, Gustave.........Lynn. 177 North Common St.
1906 Hartnett, Edward Daniel...East Boston (Boston). 256 Bennington St.
1917 Hartnett, Edward Henry Lewis Dorchester (Boston). 222 Bowdoin St.
1911 Hartnett, John Henry..... Worcester. 390 Main St.
1898 Hartung, Harry Hall......Boston. 224 Huntington Av.
1901 Hartwell, Arthur Spear....Norwood. 9 Winter St.
1902 Hartwell, Harry Fairbanks. Boston. Mass. Gen. Hosp.
1905 Hartwell, John Bryant.... Colorado Springs, Colo. 1121 North Tejon St.
1901 Hartwell, William Winn...Malden. 61 Washington St.
1919 Harvey, Clifford Dawes...Brookline. 5 Babcock St.
1920 Harvey, John Woods......Lynn. 358 Chatham St.
1898 Harvey, William Wirt.....Boston. 114 Fenway.
1893 Haskell, Henry Hill.......Auburndale (Newton). Office, Boston. 29 Commonwealth Av.
1891 Haskell, Nelson Cary......Amherst. 31 Amity St.
1914 Haskins, Frank Eugene....Boston. 204 Huntington Av.
1881 Haskins, Solomon Foot....Cotuit (Barnstable). Ocean View Av.
1913 Haslam, Frank Alden......Allston (Boston). 1404 Commonwealth Av.
1911 Hassett, Leonard Watson..Lynn. 608 Western Av.
1916 Hassman, David Morris...Brookline. 30 Kenwood St.
1882 Hastings, Judson Worthington †1918 Feeding Hills (Agawam).
1894 Hastings, Robert Worthington Brookline. 45 Kilsyth Rd.
1907 Hatch, Ralph Augustus ...Brookline. Office, Boston. 390 Commonwealth Av
1887 Hatchett, William Josephus.Somerville. 28 Arlington St.
1899 Hathaway, John Gael.....New Bedford. 388 County St.
1920 Hatt, Ednah Swasey......Newton. 109 Oakleigh Rd.
1919 Hatt, Rafe Nelson.........Newton. Office, Boston. 483 Beacon St.
1901 Haviland, Walter Childs...Worcester. 11 Elm St.
1900 Hawes, Alfred Taylor......Lynn. 85 North Common St.
1887 Hawes, Edward Everett....Barnstable. Office, Hyannis. Railroad Av.
1903 Hawes, John Bromham, 2nd.Boston. 29 Gloucester St.
1908 Hawkins, Henry...........Dorchester (Boston). Office, Boston. 394 Marlboro St.
1918 Hayden, John Joseph......Worcester. 358 Grafton St.
1898 Hayes, Albert Edwin......Providence, R. I. 128 Broad St.
1867 Hayes, Charles Cogswell †1890 Faribault, Minn. Brunswick Hotel.
1899 Hayes, Frederick Legro....Brookline. 12 Verndale St.
1905 Hayes, Justin Edward.....Northampton. 16 Center St.
1886, 1893 Hayes, Justin Gideon.. ...Williamsburg. Main St.
1914 Hayes, William Francis....Beverly. 377 Cabot St.
1917 Haywood, Ralph Winson..Boston. Relief Station. Haymarket Sq.
1869 Hazleton, Isaac Hills †1906 Wellesley Hills (Wellesley).

1900 Heald, Charles Gerry......Pepperell. Main St.
1901 Healy, Daniel Laurence...So. Framingham. 54 Concord St.
1899 Healy, Thomas Raymond...Newburyport. Office, Boston. 370 Marlboro' St.
1917 Healy, William ..........West Natick (Natick). P. O. Box 223. Office, Boston. 40 Court St.
1915 Hearn, Walter Lawrence...Lynn. 45 Franklin St.
1900 Heaton, Thomas Henry....Cambridge. 315 Broadway.
1874 1894 Hebbard, Ellery Cola..... Boston. 122 Huntington Av.
1906 Heffernan, David Aloysius. Boston. 69 Newbury St.
1919 Heffernan, Ray Joseph....Dorchester (Boston). 4 Sumner St.
1911 Hegerty, Joseph Gordon....Boston. 21 Bay State Rd.
1917 Heininger, Arthur Gustav. Gardner. 66 Parker St.
1912 Hemeon, Frederick Chipman Dorchester (Boston). 9 Standish St.
1907 Henderson, Charles Russell. Reading. 126 Woburn St.
1911 Henderson, Francis Freeman Boston. 350 Commonwealth Av.
1902 Henderson, George Dallas..Holyoke. 312 Maple St.
1910 Hennelly, Thomas Patrick..Pittsfield. 184 North St.
1912 Hennessey, Thomas Francis. Lynn. 658 Western Av.
1909 Hennessey, William Warren Salem. 333 Essex St.
1885 Henry, John Goodrich......Winchendon. 47 Pleasant St.
1920 Henson, Paul Palmer......South Yarmouth (Yarmouth).
1910 Hepburn, James Joseph....Boston. 56 Bay State Road.
1917 Herbert, Edward ........Fall River. 140 Purchase St.
1919 Herlihy, David Joseph....Cambridge. 167 Windsor St.
1918 Herman, Edwards Woodbridge Lincoln. Office, Boston. 23 Bay State Rd.
1911 Hermann, Otto John.......Roxbury (Boston). Office, Boston. 522 Commonwealth Av.
1885 Herrick, Joseph Thomas...Springfield. 684 State St.
1915 Hersam, Norman Paul.....Stoneham. 20 Hersam St.
1880 Hersey, Freeman Clarke †1914 Boston. 499 Beacon St.
1911 Hersey, Harold Waters....New Haven, Conn. N. H. Hospital.
1896 Hewes, Henry Fox........Boston. 416 Marlboro' St.
1882 Hewins, Parke Woodbury..Wellesley Hills (Wellesley) Office, Boston. 20 Beacon St.
1897 Hewitt, Clarence Elbert....Springfield. 796 State St.
1902 Hewitt, William Oakes.....Attleborough. 34 Sanford St.
1903 Hickey, John Joseph.......Peabody. 40 Main St.
1906 Hicks, George Henry.......Fall River 1973 South Main St.
1919 Hiebert, Daniel Howard...Provincetown. Commercial St.
1908 Higginbotham, Fred Augustus Watertown. 98 Mt. Auburn St.
1893 Higgins, Frank Albert.....Boston. 384 Commonwealth Av.
1914 Higgins, George Vincent...Randolph, Warren St.
1894 Higgins, James Haydyn...Marstons Mills (Barnstable).
1868 Hildreth, John Lewis †1909..New Ipswich, N. H.
1878 Hill, Edgar Dwight........Plymouth. 27 Court St.
1917 Hill, Ernest Linwood.....Framingham. 9 Lincoln St.
1896 Hill, George Hillard. ......Worcester. 15 High St.
1904 Hill, George Jackson.......Beverly. Office, Boston. 35 Commonwealth Av.
1901 Hill, George Sumner.......Boston. 295 Beacon St.
1886 Hill, Ira Clark............Springfield. 259 Central St.
1913 Hill, Lawrence Richardson. Concord, N. H. 48 Pleasant St.
1914 Hill, Lewis Webb.........Boston. 99 Commonwealth Av.
1904 Hill, Thomas Chittenden..Boston. 31 Bay State Rd.
1903 Hillard, James Pearse.....Springfield. 419 Sumner Av.
1901 Hills, Charles Everett.....South Natick (Natick).
1874 Hills, William Barker †1915 Brookline. Office, Boston. 19 Pearl St.
1914 Hilton, John Joseph Herron Lawrence. 336 Haverhill St.
1915 Hiltpold, Werner..........Easthampton. 1 Clark St.
1905 Hinchliffe, Frederick.......Cohasset. Main St.
1905 Hinchey, Richard..........Waltham. 17 Pine St.
1899 Hinckley, James William..Brookline. Office, Boston. 419 Boylston St.
1911 Hinds, Robert Watson.....Brookline. 46 Orkney Rd.
1920 Hines, Clarence Reynolds. Amesbury. 39 Market St.
1913 Hinton, William Augustus. Canton. Dedham St.
1889 Hipkiss, George...........Cambridge. 1929 Mass. Av.
1909 Hirsch, Henry Leon........Springfield. 310 Main St.
1882 1911 Hitchcock, Edward........Boston. 32 State House.
1890 Hitchcock, Henry Russell..Plymouth. 36 Main St.
1895 Hitchcock, John Sawyer...Proffit, Va.
1900 Hixon, Edwin Colfax......Brookline. 1059 Beacon St.
1908 1919 Hoban, James John.... North Chelmsford. Office, Lowell. 175 Central St.
1890 1920 Hobbie, John Remington..North Adams. 205 Main St.
1913 Hoberman, Samuel.........Malden. 217 Bryant St.
1907 Hoch, Theodore Augustus..Waverley (Belmont). McLean Hospital.
1882 Hodgdon, Andrew Hall....Dedham. 110 Maple Pl.
1917 Hodgdon, Frank Wellington, Jr. Arlington. 20 Maple St.
1903 Hodgdon, Ralph Franklin..Somerville. 16 Westwood Road
1894 Hodges, Almon Danforth...Roxbury (Boston). The Warren.
1916 Hodgkins, Edward Marshall Boston. 56 Bay State Rd.
1902 Hodskins, Morgan Brewster Palmer. Monson State Hospital.
1920 Hoey, Warren Henry......Newton Upper Falls (Newton). 65 Oak St.
1920 Hogan, Daniel John.......Charlestown (Boston). 182 Chelsea St.
1898 Hogan, Joseph Ambrose....Lawrence. 537 Essex St.
1893 Hogner, Richard Per Gustaf †1919 Boston. 365 Mass. Av.
1906 Hoitt, Charles Lewis.......Lynn. 83 Franklin St.
1883 Hoitt, Eugene Gorham.....Belmont. 87 Payson Road.
1902 Holbrook, Bradbury........Waltham. 802 Main St.
1910 Holbrook, Charles Albert...Haverhill. 50 Merrimack St.
1882 Holden, Charles Sumner....Attleborough. 7 Park St.
1889 Holden, Eugene Martin....New York, N. Y. 1 Madison Av.
1883 Holden, William Daniel....Haverhill. 74 Emerson St.
1897 Holland, Hubert Thomas...Jamaica Plain (Boston). 423 Center St.
1908 Hollings, Byam............Boston. 120 Franklin St.
1903 Holmberg, Carl Lester Magnus.....Campello (Brockton). 1111 Main St.
1909 Holmes, Arthur Brewster..Kingston. Main St.
1913 Holmes, Daniel Henry.....Middleborough. 15 School St.
1906 Holmes, George Winslow...Chestnut Hill (Newton). Office, Boston. Mass. Gen. Hospital.
1900 Holmes, Harry Bigelow....Adams. 37 Park St.
1919 Holmes, James............Springfield. 310 Main St.
1910 Holmes, John Franklin.....Manchester, N. H. 951 Elm St.
1895 Holmes, May Salona......Worcester. Belmont Hospital.
1907 Holt, Charles Herbert......Pawtucket, R. I. Masonic Bldg.
1883 Holyoke, Frank............Holyoke. 280 High St.
1914 Holzer, William Francis...Worcester. 28 Pleasant St.
1916 Holzman, Joseph..........Roxbury (Boston). 1 Elm Hill Av.

1904 Homans, John............Brookline. Office, Boston. P. B. Brigham Hosp.
1911 Honeij, James Albert.......New Haven, Conn. 320 Cedar St.
1897 Hood, Mary Gould †1915 Meredith, N. H. R. F. D. 2.
1919 Hooper, George Henry.....Boston. City Hospital.
1919 Hoover, Clayton Elvin.....Fitchburg. 60 Day St.
1900 Hopkins, Bertrand Hiram..Ayer. Washington St.
1895 Hopkins, Frederick Eugene. Springfield. 25 Harrison Av.
1912 Hopkins, John Wilson.....Hinsdale, Ill. Hinsdale Sanatorium.
1920 Hopkins, Lawrence Towle. Waverley (Belmont). 349 Trapelo Road.
1917 Hopkins, Ralph Harrison. Chatham.
1911 Hopkins, William Thorpe..Lynn. 7 Atlantic St.
1906 Hopkinson, George.........Akron, O. 50 Schiller St.
1906 Horne, Lester Wallace.....Fairhaven. 32 Union St.
1914 Hornor, Albert Aurelius...Boston. 86 Bay State Rd.
1919 Horr, Albert Winslow.....Boston. 419 Boylston St.
1915 Horrax, Gilbert...........Roxbury (Boston). P. B. Brigham Hospital.
1914 Horsman, Hiram Lionel...North Grafton (Grafton). State Hospital.
1906 Hosley, Walter Alexis.....Waban (Newton). 46 Waban Av.
1920 Hosmer, Merrill Fowler...Springfield. 340 Bridge St.
1885 Hough, Garry de Nerville..New Bedford. 542 County St.
1906 Houghton, Richard Henry..East Boston (Boston). 308 Sumner St.
1882 Houston, John Alexander..Northampton. State Hospital.
1908 Howard, Alonzo Gale......Boston. 636 Beacon St.
1911 Howard, Arthur Allison....Brookline. Office, Boston. 520 Commonwealth Av.
1917 Howard, Charles Tilden...Boston. 510 Commonwealth Av.
1898 Howard, Eugene Henry....Pittsfield. 246 North St.
1901 Howard, Frederic Hollis...Williamstown. Park St.
1917 Howard, Harvey James...Peking, China. Union Med. College.
1885 Howard, Herbert Burr.....Reading. 122 Summer Av.
1916 Howard, Herbert Handy...Somerville. 23 Franklin St.
1899 Howard, Joseph Francis...Lawrence. 8 Avon St.
1885 Howard, Margaret Emily Pagelsen Reading. 122 Summer Av.
1919 Howard, Perez Briggs.....Newtonville (Newton). 340 Walnut St.
1904 Howe, Harry Newell.......Greenfield. 7 Bank Row.
1899 Howe, Joseph Dimock.....Pittsfield. 7 North St.
1876 Howe, Octavius Thorndike. Boston. 154 Beacon St.
1885 Howe, Oliver Hunt........Cohasset. Main St.
1898 Howe, Walter Clarke......Boston. 303 Beacon St.
1917 Howe, Winfred Lewis....Everett. 657 Broadway.
1900 Howell, William Wescott...West Roxbury. Office, Boston. 279 Clarendon St.
1912 Howes, Frank Miller......New Bedford. 9 North Orchard St.
1917 Howes, Willard Boyden...Detroit, Mich. 12th St. and Tuxedo Av.
1909 Howland, Charles Abel.....Schenectady, N. Y. 1303 Union St.
1908 Howland, George Lewis....Jamaica Plain (Boston). 6 Beaufort Road.
1897 Howland, Joseph Briggs....Boston. P. B. Brigham Hosp.
1915 Hoyt, Edward Malcom....Georgetown. 38 East Main St.
1911 Hoyt, Perley Adelbert.....Ludlow. 12 North St.
1890 Hoyt, Walter Scott........Waltham. 104 Crescent St.
1909 Hubbard, Edward Dana....Gloucester. 96 Middle St.
1919 Hubbard, Eliot, Jr........Boston. 154 Riverway.
1883 Hubbard, Frank Allen.....Taunton. 157 High St.
1901 Hubbard, George William..Springfield. 327 State St.
1896 Hubbard, Joshua Clapp....Boston. 86 Bay State Rd
1881 Hubbard, Josiah Clark.....Holyoke. 249 Maple St.
1894 Hubbard, Osmon Huntley..Gilsum, N. H.
1907 Hubbell, Adelbert Merton..Haverhill. 22 Merrimack St.
1895 } 1914 } Hudnut, Frank Parker.. { New Bedford. 156 William St.
1911 Hudnut, Paul Albert.......Northampton. 65 New South St.
1916 Hughes, Edgar Hamill....Turner's Falls (Montague).
1920 Hughes, Frank............Dorchester (Boston). 148 Talbot Av.
1917 Hughes, George Frederick. Somerville. 143 Cross St.
1918 Hughes, John.............Holyoke. 243 Maple St.
1916 Hunt, Albert Foster.......Bridgewater. 28 School St.
1905 Hunt, Alice Elizabeth Palmer Holyoke. 364 Maple St.
1897 Hunt, Daniel Lawrence....Boston. 293 Commonwealth Av.
1903 Hunt, Ernest Lerol........Worcester. 120 Lovell St.
1918 Hunt, Frank Hamilton....Mattapan (Boston). 249 River St.
1902 Hunt, George Eddy........Holyoke. 364 Maple St.
1902 Hunt, George Pratt........Pittsfield. 34 Fenn St.
1911 Hunt, Harold Otis.........Newtonville (Newton). 424 Newtonville Av.
1915 Hunt, William Elliot......Bridgewater. 120 Main St.
1878 Hunt, William Otis †1920 Newtonville (Newton) 424 Newtonville Av.
1904 Hunt, Wilson Eugene......Malden. 332 Pleasant St.
1905 Hunter, Norman McLeod...Hudson. 20 Lincoln St.
1888 Hunting, Nathaniel Stevens. Quincy. 1136 Hancock St.
1908 Huntington, James Lincoln. Boston. 311 Marlboro' St.
1876 Huntress, Leonard †1914 Lowell. 46 Fort Hill Av.
1900 Hurd, Albert Gordon.......Millbury. 95 W. Main St.
1899 Hurd, Randolph Campbell..Newburyport. 244 High St.
1888 Hurley, Daniel Bartholomew East Boston (Boston). 42 Chelsea St.
1914 Hurley, Daniel Joseph.....Roslindale (Boston). Office, Boston. 21 Bay State Rd.
1906 Hurley, Edward Daniel....South Boston (Boston). Office, Boston. 419 Boylston St.
1903 Hurley, John Joseph.......Boston. 194 Bay State Rd.
1918 Hurley, William Cyril Rowe Quincy. Fore River Works.
1903 Hurwitz, Abraham Joseph..Roxbury (Boston). Office, Boston. 13 Chambers St.
1905 Hussey, Edward John.....Holyoke. 245 Maple St.
1891 Hutchings, Joseph Henry..Woburn. 514 Main St.
1909 Hutchins, Henry Talbot....Boston. 520 Commonwealth Av.
1895 Hutchinson, Charles Martin. Cambridge, 5 Garden St.
1919 Hutchinson, Charles William Concord.
1895 Hutchinson, Chessman Palmer....Auburndale (Newton). 88 Central St.
1901 Hutchinson, Walter Perkins Abington.
1920 Hutton, Willis Abram.....Springfield. 175 State St.
1916 Hyde, Harold Valmore....Boston. 483 Beacon St.
1919 Hyman, Albert Solomon...Phila., Pa. Mt. Sinai Hosp.
1917 Hyman, Clarence Henry...Cleveland, Ohio. 2765 Hampshire Rd.

## I

1892 Ilsley, Frederick Roscoe...Medford. 69 Washington St
1909 Inglis, Harry James.......Brookline. Office, Boston. 43 Bay State Rd.
1887 } 1917 } Ingraham, Lena Vaughn Brookline. 38 Webster St.
1912 Ireson, Franklin Reynolds..Marblehead. 216 Pleasant St.
1912 Irving, Frederick Carpenter Boston. 86 Bay State Rd
1917 Irving, Harry Washington Boston. 194 Huntington Av.
1897 Irwin, Vincent Joseph.....Springfield. 389 Main St.

## J

1887 Jack, Edwin Everett.......Boston. 215 Beacon St.
1886 Jack, Ernest Sanford......Melrose. 56 West Emerson St.

1883 Jack, Frederick Lafayette..Boston. 215 Beacon St.
1901 Jack, Lewis Harlow.......West Newton (Newton). 68 Chestnut St.
1899 Jackson, Alexander Washington Providence, R. I. R. I. Hospital.
1897 Jackson, Alton Atwell.....Everett. 512 Broadway.
1919 Jackson, Arthur Morison..Everett. 512 Broadway.
1892 Jackson, Charles William..Monson. Main St.
1911 Jackson, Delbert Linscott..Brookline. Office, Boston. 520 Commonwealth Av.
1885 Jackson, Fred William.....Jefferson, Me.
1919 Jackson, George Henry....Plymouth. 44 Main St.
1884 Jackson, Henry............Boston. 380 Marlboro' St.
1920 Jackson, Howard Burr....Jamaica Plain (Boston). 16 Holbrook St.
1897 Jackson, Oliver Howard....Fall River. 34 North Main St.
1892 Jackson, Ralph Wentworth.Fall River. 257 Cherry St.
1915 Jackson, Roy Chase.......Worcester. State Hospital.
1880 Jackson, William Benjamin.Lowell. 229 Stevens St.
1915 Jacoby, Rudolph...........Weymouth. 24 Commercial St.
1911 Jacques, Hector............Fitchburg. 193 Water St.
1913 Jakmauh, Paul John......South Boston (Boston). 509 Broadway.
1906 Janes, Arthur Percy.......Newton. Office, Boston. 419 Boylston St.
1908 Janes, Benjamin Franklin, Jr. Northampton. 218 Elm St.
1898 Janes, George Herbert.....Westfield. 80 Elm St.
1918 Janjigian, Robert Rupen...Bangor, Me. State Hospital.
1920 Jankelson, Isaac Rudolph..Roxbury (Boston). 73 Humboldt Av.
1919 Janney, James Craik......Cambridge. Office, Boston. 205 Beacon St.
1913 Jantzen, Francis Thomas...Boston. 514 Commonwealth Av.
1880 Jaques, Henry Percy......Lenox. "Cliffwood."
1884 Jarvis, William Furness...Waltham. 326 Lexington St.
1897 1919 Jelalian, Hairabed S... Fresno, Calif.
1920 Jellis, Walter.............Somerville. 1028 Broadway.
1890 Jelly, Arthur Carlton......Boston. 144 Commonwealth Av.
1883 Jenkins, Charles Edwin....Lynn. 10 Ireson St.
1891 1920 Jenkins, Thomas Lincoln.Topsfield.
1905 Jennings, Curtis Herman...Fitchburg. 117 Pine St.
1919 Jensen, William Christian.Worcester. 41 Pleasant St.
1912 Jessaman, Leon Webster...Framingham. 60 Concord St.
1915 Jewett, Everett Porter.....West Springfield. 19 Worthen St.
1917 Jewett, Howard Wakefield Lowell. 226 Central St.
1887 Jillson, Franklin Campbell.West Roxbury (Boston). 11 Hastings St.
1913 Johnson, Alfred Emil, Jr...Greenfield. 191 Main St.
1915 Johnson, Charles Frederic.Newburyport. 45 Washington St.
1901 Johnson, David Joseph....Roxbury (Boston). 1 Schuyler St.
1920 Johnson, Elmon Reuben...Wollaston (Quincy). 389 Newport Av.
1907 Johnson, Erik St. John...New Bedford. 271 Union St.
1884 Johnson, Francis Emerson.Erving.
1880 Johnson, Frederick William.Boston. 167 Newbury St.
1913 Johnson, Harold Abbott....Lynn. 70 Broad St.
1915 Johnson, Herbert Lester...Roxbury (Boston). Office, Boston. 520 Beacon St.
1914 Johnson, Herbert Lewis....Hadley. Main St.
1908 Johnson, John Birger Albert Lowell. 53 Central St.
1894 Johnson, Mary Williamina Lougee Chestnut Hill (Brookline). 158 Wolcott Road.
1894 Johnson, Orville Edson....Winthrop. 123 Winthrop St.
1903 Johnson, Peer Prescott.....Beverly. 15 Washington St.
1914 Johnson, Sarah Coppinger Franconia. N. H.
1883 Johnson, William Augustus.Lowell. 145 Merrimack St.
1878 Johnson, William Louis....Uxbridge. Main St.
1908 Johnston, William.........Dorchester (Boston). 210 Norfolk St.
1902 1917 Johnstone, William Joseph Jamaica Plain (Boston) Office, Boston. 196 Huntington Av.
1920 Jones, Basil Bradbury....Boston. Mass. Gen. Hosp.
1890 Jones, Charles David......Malden. Office, Boston. 137 Newbury St.
1897 Jones, Daniel Fiske........Boston. 195 Beacon St.
1891 Jones, Elgin Wilbur.......Lynn. 44 Atlantic St.
1919 Jones, Frank Leslie........West Somerville. 731 Broadway.
1918 Jones, Fred Durgin........Springfield. 175 State St.
1897 Jones, Frederick Ellis.....Quincy. 1150 Hancock St.
1905 Jones, Frederick Elmer...Brookline, 48 Corey Rd.
1887 Jones, Gilbert Norris......Wellesley Hills (Wellesley).
1897 Jones, John Clarke........Brookline. 56 Hawes St.
1892 Jones, Lombard Carter.....Waquoit (Falmouth). 80 Humphrey St.
1892 Jones, Lyman Asa.........Swampscott.
1898 Jones, Mary Scott.........Boston. 82 St. Stephen St.
1903 Jones, Raymond Child......Fitchburg. 1085 River St.
1911 Jones, Robert Le Roy.....Lowell. 219 Central St.
1905 Jones, Wellington West....Housatonic (Great Barrington). 41 Main St.
1893 Jones, William Marks.....Lowell. 145 Merrimack St.
1873 Jordan, George Albert †1913 Worcester. 46 Myrtle St.
1905 Jordan, John Franklin.....Peabody. 76 Lynn St.
1919 Jordan, Michael Matthew..Worcester. 41 Pleasant St.
1894 Joslin, Elliott Proctor......Boston. 81 Bay State Rd.
1911 Joslyn, Arthur Everett.....Lynn. 531 Chestnut St.
1901 Jouett, Fred Robert.......Cambridge. 3 Garden St.
1906 1912 Joyce, Thomas Francis...Lawrence. Chickering St.
1914 Judd, Ernest Hart.........Springfield. 25 Maple St.
1912 Judkins, Charles Louville Mason Lynn. Office, Boston. 149 Newbury St.
1891 Judkins, Frank Louville...Lynn. 7 Mason St.
1915 Jurist, Charles............Springfield. 841 North St.

## K

1890 Kaan, George Warton.....Brookline. Office, Boston. 419 Boylston St.
1917 Kable, Josephine Downie..Worcester. Memorial Hosp.
1916 Kandib, Anna Hilda......Medfield. State Hospital.
1917 Kane, William Vincent....Lynn. 11 Bay View Av.
1914 Kaplovitch, Henry.........Haverhill. 50 Merrimack St.
1920 Kasses, Saad Hanna Allah.Lowell. St. John's Hosp.
1904 Katsalnos, George Michel..Boston. 176 Huntington Av.
1919 Kaufman, Morris Frank...Worcester. 97 Grafton St.
1903 Keaney, Henry Joseph.....Everett. 385 Broadway.
1901 Kearney, John Henry......Fitchburg. 137 Prichard St.
1909 Kearney, Joseph Patrick...Lowell. 10 East Merrimack St.
1886 Keefe, Daniel Edward..... †1919 Springfield. 394 Chestnut St.
1880 1902 Keefe, Patrick Henry... Providence, R. I. 257 Benefit St.
1889 Keegan, Charles Andrew...Arlington. 734 Mass. Av.
1906 1911 Keeler, William Basil... Roxbury (Boston). 5 Wyoming St.
1902 1914 Keenan, George Francis..Boston. 475 Beacon St.
1897 Keenan, Herbert John.....South Boston (Boston). 254 Broadway.
1916 Keenan, James Alphonsus.Roxbury (Boston). 2 Rockville Park.
1903 1920 Keene, Charles Herbert..Harrisburg, Pa. Dept. Public Instruction.
1910 Keever, Henry Floyd.......Auburndale (Newton). 69 Maple St.
1904 Keith, Halbert Lynn.......Milford. 255 Main St.

1884 **Keith, Wallace Cushing**....Brockton. 237 North Main St.
1892 **Keleher, William Henry**...Woburn. 48 Pleasant St.
1910 **Kelleher, Jeremiah Edward**.Haverhill. 85 Emerson St.
1896 **Kelleher, Patrick Francis**..Cambridge. 1713 Mass. Av.
1912 **Kelley, Clarence Moore**....Concord, N. H. 12 Center St.
1917 **Kelley, Eugene Robert**....Brookline. Office, Boston. 546 State House.
1916 **Kelley, Henry Joseph**.....Beverly. 222 Cabot St.
1903 **Kelley, Joseph Henry Hart** Dorchester (Boston). 195 Ashmont St.
1914 **Kelley, Lawrence Kendall**..Peabody. 39 Washington St.
1914 **Kelley, Robert Edward Stack** Mattapan (Boston). 249 River St.
1883 **Kellogg, Edward Brinley**...Boston. Office, 178 Devonshire St.
1912 **Kellogg, Foster Standish**...Boston. 19 Bay State Rd.
1892 } 1899 } **Kellogg, Frederic Leroy** { Boston. 350 Commonwealth Av.
1908 **Kelly, John Michael**.......Dorchester (Boston). 182 Bowdoin St.
1920 **Kelly, Otis Francis**........Hathorne (Danvers). State Hosp.
1893 **Kelly, William P**..........Pittsfield. 61 Union St.
1913 **Kemp, Howard Martin**.....Greenfield. 24 Franklin St.
1915 **Kemp, Lysander Schaffer**..Canton. Mass. Hosp. Sch
1895 } 1902 } **Kennard, Harry Delano**...Peabody. 84 Main St.
1877 **Kennealy, John Henry**.....Brookline. 117 Harvard St. †1919
1898 **Kennedy, Alexander Gladstone** Boston. 1075 Boylston St.
1905 **Kennedy, Edward Anthony**.Great Barrington. 400 Main St.
1901 **Kennelly, Julia Grice**.....Cambridge. Kennedy Rd.
1913 **Kenney, Clarence Bronson**.Winchendon. 22 Walnut St.
1909 **Kenney, Thomas Francis**...Worcester. 22 Pleasant St.
1920 **Kenney, Thomas Hopper**..Northampton. 78 Main St.
1905 **Kenney, Walter Clement**...Winchendon. 22 Walnut St.
1909 **Kennison, Frederick Marshman** Newton, N. H. Main St.
1907 **Kent, Bradford**...........Dorchester (Boston). 798 Blue Hill Av.
1905 **Kent, Ralph Porter**........Attleborough. 27 South Main St.
1914 **Kenworthy, Marion Edwena** New York City, N. Y. 610 Lexington Av.
1918 **Keown, James Archibald**...Lynn. 42 High St.
1900 **Kepler, Charles Ober**......Boston. 362 Commonwealth Av.
1904 **Kerr, Isabella Dickieson**...Boston. 483 Beacon St.
1915 **Kerrigan, John Joseph**.....Fall River. 157 South Main St.
1911 **Kerrigan, Joseph Henry**...Stoneham. 66 Central St.
1916 **Kewer, Leo Thomas**.......Mattapan (Boston). Boston State Hospital.
1917 **Khoury, Kamel** ..........Worcester. 14 Lake Av.
1909 **Kickham, Charles Joseph**..Brookline. Office, Boston. 536 Commonwealth Av.
1908 **Kilbourn, Arthur Goss**.....Groton. Main St.
1884 **Kilburn, Henry Whitman**..Boston.
1913 **Kilburn, Ira Nelson**........Holyoke. 125 Chestnut St.
1914 **Killam, Franklin Harrison** Mountain View, N. H.
1914 **Killelea, Edward Vincent**..Fitchburg. 5 Day St.
1890 **Kilroy, Philip**.............Springfield. 61 Chestnut St.
1905 **Kimpton, Arthur Ronald**...Boston. 66 Bay State Rd.
1909 **King, Frederick Augustine**.Marshfield. Main St.
1910 **King, George Clifford**......Fall River. 150 Purchase St.
1898 **King, Myron Louis**........Cambridge. 788 Mass. Ave.
1888 **King, Nathaniel Clark**.....Campello (Brockton). 1147 South Main St.
1910 **King, Nicholas James Quan** Roslindale (Boston). 44 Ashland St.
1904 **Kinloch, Raymond Alexander** Springfield. 83 Walnut St.
1919 **Kinne, Arthur Lyman**.....Holyoke. 265 Maple St.
1914 **Kinne, George Lyman**.....Holyoke. 265 Maple St.
1900 **Kinney, William D'Arcy**...Osterville (Barnstable).
1908 **Kinnicutt, Roger**...........Worcester. 56 Cedar St.
1904 **Kirby, Holder Crary**.......New Bedford. 33 South Sixth St.
1907 **Kirkpatrick, George Holland** Lynn. 192 South Common St.
1915 **Kirkwood, Allan Stewart**..Montclair, N. J. 61 Elm St.
1910 **Kissock, Robert James**.....New York City. 1 Madison Av.
1898 **Kite, Walter Chester**......Milton. 17 Russell St.
1920 **Kitsis, Hyman**............Boston. 362 Commonwealth Av.
1880 **Kittredge, Joseph**..........North Andover. 56 Academy Rd.
1874 **Kittredge, Thomas**.........Salem. 13 Chestnut St. †1919
1918 **Klein, Armin**..............Chelsea. Office, Boston. 483 Beacon St.
1905 **Kleinert, Margaret Noyes**..Boston. 101 Newbury St.
1914 **Kline, George Milton**.......Beverly. Office, Boston. 36 State House.
1899 **Knight, Charles Eugene**....Rockland. 371 Union St.
1902 **Knight, Charles Lewis**.....West Roxbury (Boston). Office, Boston 544 Columbus Av.
1902 **Knight, Charles Sumner**...Westborough. 54 West Main St.
1896 **Knight, Marcus Whitney**...Milford. 8 West St.
1889 **Knowles, James Harris**....Gloucester. Eastern Point.
1884 **Knowles, William Fletcher**.Brookline. Office, Boston. 520 Commonwealth Av.
1892 **Knowlton, Charles Davison**.Roxbury (Boston). 574 Warren St.
1910 **Knowlton, Edward Allen**...Holyoke. 250 Maple St.
1901 **Knowlton, William Thomas**.HubbardstonWorcester Rd.
1911 **Knudson, Mette Marie**.....West Roxbury (Boston). 78 Park St.
1894 **Konikow, Moses Joseph**....Roxbury (Boston). 486 Warren St.
1916 **Konrad, Frank Charles William** Boston. 366 Commonwealth Av.
1916 **Koplin, Harry**............Springfield. 172 Main St.
20 **Kotler, Moses George**.....Brockton. Brockton Hosp.
1901 **Kurth, Gustave Emil**......Lawrence. 86 East Haverhill St.
1919 **Kurth, Harold Richard**....Lawrence. 477 Essex St.

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1917 **Lacey, Walter Hamer**.....Keene, N. H. 78 West St.
1909 **Lachance, Alfred Philias**...Gardner. 14 Main St.
1900 **Ladd, Maynard**............Boston. 270 Clarendon St.
1907 **Ladd, William Edwards**...Boston. 326 Dartmouth St.
1906 **Lahey, Francis Howard**....Boston. 638 Beacon St.
1899 **Laighton, Florence Marion**.New York City, N. Y. 33 West 96th St.
1917 **La Liberté, Elie Joseph**...Fall River. 1420 So. Main St.
1902 } 1915 } **Lally, Francis Henry**.....Milford. 5 Park Terr.
1914 **Lally, William James**......Washington, D. C. 1107 Mass. Av., N. W.
1892 **LaMarche, Walter Joseph**..Cambridge. 1038 Mass. Av.
1901 **Lambert, Fred De Forest**..Tyngsborough.
1901 **Lambert, John Henry**......Lowell. 202 Merrimack St.
1912 **LaMoure, Charles Ten Eyck** Mansfield Depot, Conn. State Tr. School and Hospital.
1894 **Lamoureux, Joseph Elzear**.Lowell. 763 Merrimack St.
1892 **Lancaster, Sherman Russell** Cambridge. 27 Williams St.
1891 **Lancaster, Walter Brackett** Newton Center (Newton). Office, Boston. 520 Commonwealth Av.
1919 **Lancey, Clifford Scales**....Charlton. Main St.
1909 **Lane, Clarence Guy**........Woburn. Office, Boston. 21 Bay State Rd.
1914 **Lane, Clayton Rogers**......Santa Ana, Calif. 306 Spurgeon Bldg.
1884 **Lane, Edward Binney**......Jamaica Plain (Boston). Office, Boston. 419 Boylston St.

1916 Lane, Elwin Dexter...... Andover. 9 Locke St.
1905 Lane, John William.......Dorchester (Boston). Office, Boston. 520 Beacon St.
1900 Lane, Walter Appleton....Milton. 173 School St.
1904 Lang, Herbert Bowman....South Hadley.
1919 Langill, Morton Howard...Worcester. 22 Pleasant St.
1896 Langlois, Joseph Augustus.Pittsfield. 54 Bradford St. †1919
1920 Lanman, Thomas Hinckley Cambridge. Office, Boston. 286 Marlboro' St.
1907 Lanpher, Howard Arthur. Chester.
1919 Lapham, George Nelson...Rutland. Main St.
1915 LaRiviere, Athanase de Charette Evariste New Bedford. 96 Mt. Pleasant St.
1918 La Rochelle, Arthur Henry Springfield. 508 Main St.
1913 La Rochelle, Fred Désiré..Springfield. 508 Main St.
1915 Larrabee, Frank Walton...Brighton (Boston). 4 Nonantum St.
1905 Larrabee, Herbert Manson.Tewksbury. Main St.
1897 Larrabee, Ralph Clinton..Boston. 912 Beacon St.
1920 Laserte, Charles John.....Leominster. 50 Central St.
1911 Laskey, Edward Phillip....Haverhill. 90 Emerson St.
1899 Latham, Benoni Mowry....Mansfield. 26 No. Main St.
1898 Lavalée, George Omer.....Lowell. 790 Merrimack St.
1920 Lavelle, Gertrude Helen..Worcester. Memorial Hosp.
1872 LaVigne, Alfred Willis Lowell. 173 Merrimack St †1913
1906 Law, Katharine Hayes.....Erie, Pa. 247 West 8th St.
1888 Lawler, William Patrick...Lowell. 53 Central St.
1914 Lawley, Brace Irving......Arlington. 214 Mass. Av.
1907 Lawlor, Edward Francis...Lawrence. 33 Tremont St.
1916 Lawlor, James Francis....Beverly. 1 Knowlton St.
1916 Lawlor, John Charles.....Address unknown.
1911 Lawrence, Charles Henry..Brookline. Office, Boston. 520 Commonwealth Av.
1896 Lawrence, James Wilmot..Malden. 25 Washington St.
1897 Lawrence, Joseph Henry..Brockton. 23 Main St.
1873 Lawrence, Robert Means Boston. 177 Bay State Rd. †1912
1916 Lazarus, Louis...........Worcester. 9 Vernon St.
1895 1917 Leach, Albert Clinton.. Orange. 34 W. Main St.
1894 Leach, Edward Mortimer..Rochdale (Leicester).
1893 Leach, Horace Morton †1911 Rochdale (Leicester).
1892 Leahey, George Aloysius..Lowell. 128 Merrimack St.
1895 Leard, John Samuel Hick..Jamaica Plain (Boston). 392 Arborway.
1919 Learned, Elmer Turell.....Fall River. 46 Franklin St.
1887 Learned, William Turell...Fall River. 42 Franklin St.
1892 Learoyd, Charles Berry....Taunton. 2 Vine St.
1914 Leary, Alfred James.......Newton. 23 Peabody St.
1905 Leary, Chrysostom John...New Bedford. 337 Union St.
1901 Leary, Olga Cushing.......Jamaica Plain (Boston). 44 Burroughs St.
1913 Leary, Patrick Frank......Turner's Falls (Montague) 112 Avenue A.
1906 Leary, Timothy............Jamaica Plain (Boston). Office, Boston. 416 Huntington Av.
1897 Leary, William Charles...Springfield. 630 Main St.
1916 Leavitt, Frank Clyde......Belmont. 578 School St.
1917 Leavitt, Mary Augusta....Medford. Office, Boston. 510 Commonwealth Av.
1914 Leavitt, Peirce Henry.....Brockton. 129 W. Elm St.
1865 Leavitt, William Whipple Pittsfield. 120 South St. †1906
1909 LeBœuf, Alfred Thomas...Salem. 319 Lafayette St.
1916 Ledbury, John William....Uxbridge. No. Main St.
1910 Lee, Harry Jason..........Boston. 535 Beacon St.
1907 Lee, Roger Irving.........Cambridge. 7 Lowell St.
1914 Lee, Wesley Terence.......Boston. 220 Clarendon St.
1912 Leeper, Marion Eleanor....Northampton. 36 Bedford Terrace.
1900 Legg, Arthur Thornton.....Boston. 535 Beacon St.
1905 LeGro, Lester Burnside....Bradford (Haverhill). Office, Haverhill. 50 Merrimack St.
1919 Leib, Edwin Roy..........Worcester. 22 Pleasant St.
1916 Leith, Richard Bliss.......Lawrence. 238 Haverhill St.
1911 Leland, Forrest LeRoy.....South Hadley Falls (South Hadley). 44 Bardwell St.
1877 Leland, George Adams.....Boston. 354 Commonwealth Av.
1912 Leland, George Adams, Jr..Boston. 144 Commonwealth Av.
1917 Leland, Harold Leander..Lowell. 226 Central St.
1919 Leland, Leslie Phillips.....Worcester. 238 Lincoln St.
1903 Lemaire, Willard Wallace.Worcester. 458 West Boylston St.
1908 Lemaire, William Franklin.East Lynn (Lynn). 134 Chestnut St.
1913 Lemay, Alfred Mederic....Brockton. 7 Main St.
1906 Lemieux, Théodule Alfred.Lawrence. 356 Haverhill St.
1919 Lena, Hugh Francis.......New London, Conn. 154 Broad St.
1916 Leonard, Edward DeWitt..Newton Center (Newton). 50 Everett St.
1913 Leonard, Ralph Davis.....Melrose. Office, Boston. 43 Bay State Rd.
1915 Leonard, Zenas Lockwood..West Stockbridge. Office, Pittsfield. 100 North St.
1908 Leslie, Charles Thomas....Pittsfield. 86 North St.
1910 L'Esperance, Oscar Raöul Talon Boston. 100 Boylston St.
1908 Lesses, Max...............Salem. 62 Washington Sq.
1914 Levek, Joseph Arthur......Lawrence. 32 Lawrence St.
1920 Leverone, Louise May.....Boston. 346 North St.
1916 Levine, Harry Benjamin...Roxbury (Boston). 548 Warren St.
1915 Levine, Samuel Albert.....Brookline. Office, Boston 21 Bay State Rd.
1904 Levins, Nathan Noah......Boston. 30 Chambers St.
1894 Lewis, Arthur Cuthbert....Fall River. 1018 North Main St.
1906 Lewis, Elisha Sears.......Worcester. 28 Pleasant St.
1913 Lewis, Frank Edward.....Nantucket
1906 Lewis, James Prince.......Waltham. Office, Boston. 543 Boylston St.
1914 Lewis, Seth Ames.........Springfield. 45 North Main St.
1897 Libby, Edward Norton.....Roxbury (Boston). Office, Boston. 638 Beacon St.
1893 Libby, Jesse Herbert......East Weymouth (Weymouth).
1903 Libby, Mildred Augusta....Wrentham. State School.
1918 Lichtenthaeler, Marguerite Emile Wellesley Hills (Wellesley). 111 Washington St.
1912 Liebman, William.........Brookline. Office, Boston. 1069 Boylston St.
1915 Limauro, Louis Herbert....Lynn. 17 Franklin St.
1912 Lincoln, George Chandler..Worcester. 125 Pleasant St.
1889 Lincoln, Jacob Read.......Millbury.
1903 Lincoln Merrick...........Worcester. 31 Irving St.
1919 Lindberg, Cosa Dell Haskell Lincoln, Nebraska. 936 South 28th St.
1919 Lindberg, David Oscar Nathaniel Denver, Colo. U. S. Army. Fitzsimmons Gen'l Hosp.
1903 Lindquist, Carl Augustus..Boston. 24 Westland Av.
1915 Lindsay, John Crandall....Dorchester (Boston). State Hospital.
1897 Lindsay, Joseph Ira....... Westboro.
1913 Lindsay, Marie Strom.....Dorchester (Boston). State Hospital.
1904 1914 Lindsey, John Hathaway. Fall River. 151 Rock St.
1905 Linenthal, Harry..........Roxbury (Boston). Office, Boston. 45 Bay State Rd.
1886 Linfield, Edwin Porter....Brockton. 43 Hillcrest Av.
1920 Lipsitt, Charles Saul......New Bedford. 283 Pleasant St
1884 Litchfield, William Harvey.Brookline. 1378 Beacon St.
1895 Little, Abby Noyes.........Newburyport. 22 Essex St.
1916 Little, George Thomas.....Uxbridge. Oak St.
1904 Little, John Mason........Boston. 374 Marlboro' St.
1884 Little, William Brimblecom.Lynn. 13 Nahant St.

1898 1907 Littlefield, George Curtis. Webster. 492 Main st.
1909 Littlefield, Marion Curtis...Bradford (Haverhill). Office Haverhill. 50 Merrimack St.
1893 Littlefield, Samuel Horace..Roxbury (Boston). The Warren.
1909 Littlewood, Thomas........Pittsfield. 150 North St.
1909 Liverpool, Coval Henry....West Somerville (Somerville). 325 Highland Av.
1900 Livingston, Clarence Bertram Lowell. 258 Merrimack St.
1900 Livingston, Ernest George..Lowell. 153 Westford St.
1906 Lloyd, Henry Demarest....Boston. 488 Commonwealth Av.
1903 Locke, Edwin Allen........Boston. 311 Beacon St.
1889 Lockhart, Joseph Smith....Cambridge. 837 Mass. Av.
1910 Loder, Halsey Beach.......Boston. 520 Commonwealth Av.
1903 Loewe, Leonard Joseph....Middletown, Conn. 135 South Main St.
1920 Loftus, John Thomas.....Worcester. 112 Clayton St.
1920 Long, Rufus Wilfred......Boston. City Hospital.
1915 Look, Percy Jonathan......Andover. 115 Main St.
1902 Lord, Frederick Taylor....Boston. 305 Beacon St.
1896 Lord, Sidney Archer.......Concord. Nashawtuc Rd.
1907 Lorimer, Felix............Los Angeles, Calif.
1920 Loring, Benjamin Tappen Watertown. 186 Mt. Auburn St.
1897 Loring, Robert Gardner....Lincoln. Office, Boston. 140 Beacon St.
1876 Loring, Robert Pearmain...Newton Center (Newton). †1917 19 Crescent Av.
1890 Lothrop, Howard Augustus.Boston. 101 Beacon St.
1909 Lothrop, Oliver Ames......Newton. Office, Boston. 101 Beacon St.
1895 Lougee, Frank Taylor......Newton. Office, Lynn. 11 Atlantic St.
1912 Lougee, George Woodworth.Lynn. 57 Estes St.
1910 Lougee, John Leroy........Boston. 483 Beacon St.
1899 Lougee, William Wheeler..Malden. 195 Main St.
1897 Loughran, James Francis..Lowell. 219 Central St.
1917 Louis, Lawrence Joseph....Roxbury (Boston). Office, Boston. 19 Bay State Road.
1872 Lovejoy, Charles Averill...Lynn. 64 Broad St.
1885 Lovell, Charles Edward....Whitman. 167 South Av.
1894 Lovell, David Bigelow.....Worcester. 340 Main St.
1900 Lovell, Martha Eleanor....Brookline. 60 Babcock St.
1916 Lovesey, Burton Edward..Lowell. Lowell Gen'l Hosp.
1884 Lovett, Robert Williamson.Boston. 234 Marlboro' St.
1903 Lowd, Harry Mosher.......Swampscott.
1886 Lowe, Fred Messenger.....West Newton (Newton). 1354 Washington St.
1901 Lowell, Albert Fay........Gardner. 22 Vernon St.
1898 Lowell, Alverne Percy.....Fitchburg. 52 Hartwell St.
1901 Lowell, Freeman Lamprey Boston. 2A Milford St.
1905 Lowell, William Holbrook.Winchester. Office, Boston 101 Newbury St.
1906 Lowney, Dennis Joseph....New Bedford. 181 Middle St.
1902 Lowney, John Francis.....Fall River. 755 Plymouth Av.
1915 Lowrey, Lawson Gentry...Iowa City, Iowa. Psychopathic Hospital.
1918 Lowry, Franklin Patterson.Newton. 450 Center St.
1905 1920 Lucas, Julian Dyer...... Roxbury (Boston). 108 Warren St.
1910 Lucas, William Palmer....San Francisco, Calif. University Hospital.
1908 Luce, Dean Sherwood......Canton. 298 Sherman St.
1913 Luce, LeRoy Alson........Boston. 536 Commonwealth Av.
1898 Luchsinger, Harry Warner.Housatonic (Great Barrington). Main St.
1920 Lucy, John Joseph........Boston. 24 McLean St.
1913 Luftig, Jacob.............Roxbury (Boston). 562 Warren St.
1920 Lund, Charles Carroll.....Boston. Mass. Gen. Hosp.
1891 Lund, Fred Bates.........Boston. 527 Beacon St.
1908 Lundwall, Laurence Svante Bernhard Gardner. 81 Main St.
1920 Lunt, Lawrence Kirby....Stockbridge.
1908 Lupien, Henry John.......Brockton. 63 Main St.
1920 Lurie, Moses Hyman......Boston. 483 Beacon St.
1890 Lussier, Charles Arthur...Worcester. 154 Grand St.
1913 Lyle, Eveline Burton......Brookline. 14 Marion St.
1914 Lyman, Henry............Boston. 109 Commonwealth Av.
1907 Lyman, William Robinson.Dowagiac, Mich.
1899 Lynch, Charles Francis....Springfield. 175 State St.
1903 Lynch, Cornelius Joseph...Quincy. 1620 Hancock St.
1908 Lynch, Daniel Lawrence...Roslindale (Boston). Office, Boston. 50 Oliver St.
1919 Lynch, Joseph Michael.....Dorchester (Boston). 12 Romsey St.
1902 Lynch, Patrick Michael....Springfield. 39 Main St.
1911 Lynch, William Francis...Worcester. 390 Main St.
1920 Lyon, Walter Sidney......Fall River. 359 Second St.
1914 Lyons, George Aloyslus....Lynn. 120 South Common St.
1896 Lyons, Joseph Benedict....Charlestown (Boston). 1 Dexter Row.

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1889 MacArthur, George Elden..Ipswich. 45 Central St.
1913 MacAusland, Andrew Roy.Boston. 240 Newbury St.
1905 MacAusland, William Russell Boston. 240 Newbury St.
1913 Macauley, Joseph Arthur..Dorchester (Boston). 12 West Cottage St.
1907 MacCallum, Wallace Peter.Boston. 214 Huntington Av.
1912 MacCorison, Carl Copeland North Reading. State Sanatorium, P. O. North Wilmington.
1896 Macdonald, Alexander Ambrose Dorchester (Boston). 119 Washington St.
1887 Macdonald, Colin William..Roxbury (Boston). 1 New Heath St.
1909 MacDonald, Donald Francis Taunton. 10 White St.
1906 Macdonald, Frederick Cornelius Roxbury (Boston). 622 Warren St.
1914 MacDonald, Frederick Livingstone Waltham. Office, Boston. 220 Marlboro' St.
1913 Macdonald, John Bernard.Hathorne (Danvers). State Hospital.
1908 MacDonald, William Campbell Malden. 590 Main St.
1865 Macdonald, William Lewis †1903 Wellesley Hills (Wellesley).
1908 Mace, Charles Herbert....Huntington. Russell Road.
1920 Mace, Roswell Greenwood.Springfield. Springfield Hospital.
1913 MacFadyen, John Alexander Worcester. 118 Belmont St.
1916 MacGray, Charles Leverne.Needham. 1088 Great Plain Av.
1917 MacIntyre, William Angus Washington, D. C. St. Elizabeth's Hosp.
1914 MacIver, George Albert...Bridgeport, Conn. Bridgeport Hospital.
1901 Mackay, Edward Hart....Clinton. 92 Walnut St.
1898 MacKay, George Finlay...Dalton. 71 Main St.
1915 MacKenzie, Roland Chester Waltham. 210 Main St.
1906 MacKerrow, Horace Gilford Worcester. 96 Eastern Av.
1885 Mackie, Laura Viola Gustin †1920 Attleborough. 157 Pleasant St.
1899 Mackie, William Charles...Brookline. 54 Coolidge St.
1905 MacKillop, Daniel.........Cambridge. 307 Broadway.
1907 MacKinnon, Donald Lauchlin Truro, N. S. Prince St.
1898 MacKnight, Adam Stephenson Attleborough. Attleborough. Oak Hill Av.
1919 MacKnight, Richard Patton.Fall River. 355 North Main St.
1914 MacKnight, William Frank.Boston. 198 St. Botolph St.
1919 MacLean, Donald John....Palmer. 46 Thorndike St.
1909 MacLennan, Angus Daniel.Boston. 654 Tremont St.

1907, 1913, 1915 MacLeod, John Malcolm..Quincy. 28 Federal St.
1908 MacLeod, Norman Murray. Newport, R. I. 6 Powell Ave.
1911 MacMichael, Earle Haggett. Malden. 1 Mountain St.
1920 MacMillan, Alexander Stewart West Somerville (Somerville).
1890 MacMillan, Andrew Louis †1915 Hanover. Washington St.
1910 MacMillan, Andrew Louis, Jr. Concord, N. H. 28 South Main St. 124 Professors' Row.
1920 MacMillan, Leslie Hooper. West Somerville (Somerville). 124 Professors' Row.
1910 MacNeil, Charles Seward Jadis Malden. 143 Main St.
1912 Macomber, Donald.........West Newton (Newton). Office, Boston. 321 Dartmouth St.
1919 MacPherson, Donald John. Boston. 252 Marlboro' St.
1904 Macrae, Annie Campbell...Fall River. 130 Rock St.
1904 Madden, William Daniel..Boston. 669 Mass. Av.
1905 Magrath, George Burgess .Boston. 274 Boylston St.
1898 Maguire, Charles Francis..Somerville. 432 Medford St.
1906 Maguire, Eugene Leo......Somerville. 390 Medford St.
1908 Magune, Frank Leroy.....Worcester. 28 Pleasant St.
1903 Magurn, Francis Thomas Louis Charlestown (Boston). 112 Main St.
1913 Mahar, Harold Robert Collins Orange. Prospect St.
1904 Mahoney, Daniel Francis..Brookline. Office, Boston. 520 Commonwealth Av.
1898 Mahoney, Edward Joseph..Springfield. 4 Mattoon St.
1905, 1915 Mahoney, Francis Xavier..Dorchester (Boston). 701 Columbia Rd.
1896 Mahoney, George Clifton...West Somerville (Somerville). 97 College Av.
1917 Mahoney, John Lewis.....Boston. 419 Boylston St.
1888 Mahoney, Stephen Andrew. Holyoke. 630 Dwight St.
1913 Mahoney, Walter Francis..Westborough. 39 South St.
1902 Mahony, Francis Ronan...Lowell. 8 Merrimack Sq.
1899 Mains, Charles Frederick..Dorchester (Boston). 208 Ashmont St.
1915 Mains, Herbert Llewellyn..Danvers. 71 Holton St.
1905 Makechnie, Arthur North..Cambridge. 14 Upland Rd.
1891 Mallory, Frank Burr......Brookline. Office, Boston. City Hospital.
1903 Malone, Charles...........Jamaica Plain (Boston). 46 St. John St.
1908 Maloney, John Martin.....Springfield. 521 Liberty St.
1893 Manahan, Herbert Wellington Lawrence. 104 South Broadway.
1901 Mandell, Augustus Hamlin. New Bedford. 25 Sycamore St.
1906, 1919 Maney, John Joseph..... Lawrence. 90A Lawrence St.
1893 Mangan, John Joseph.... Lynn. 174 South Common St.
1902 Manix, Edward Tuck......Lynn. 59 Lewis St.
1920 Mann, David Edwin......Rutland. State Sanatorium.
1908 Mannix, Louis Edward....Cheshire.
1916 Manoogian, Byzant John..Peabody. 65 Main St.
1915 Mansfield, Burleigh Burton Ipswich.
1897 Mansfield, James Albert...Dorchester (Boston). 42 Hancock St
1899 Mansur, Leon Wallace.....Los Angeles, Calif. 1109 Brockman Bldg.
1912 Marble, Henry Chase......Boston. 216 Newbury St.
1903 Marcley, Walter John......Minneapolis, Minn. 9th St. and Nicollet Av.
1863 Marcy, Henry Orlando....Boston. Office, Cambridge. 860 Mass. Av.
1901 Marcy, Henry Orlando, Jr. Newton. 140 Sargent St.
1916 Margeson, Reginald Dimock Boston. 520 Commonwealth Av.
1903 Markham, Erwin Walter...Lee. Main St.
1919 Marnoy, Samuel Louis....Chelsea. 199 Chestnut St.
1913 Marr, Edward Loring.....Melrose. 314 Main St.
1907 Marr, Myron Whitmore...Pinehurst, N. C.
1912 Marr, Robert McClellan... Westfield. 90 Elm St.
1912 Marsden, George..........New Bedford. 1579 Acushnet Av.
1915 Marsh, Albert.............Wellesley. Wellesley Av.
1895 Marsh, Arthur White.....Worcester. 690 Main St.
1903 Marshall, Augustus Thompson Chelsea, Vt.
1909 Marshall, Herman Weston. Boston. 86 Bay State Rd.
1908 Marshall, William Reginald Lynn. 22 Broad St.
1911 Marston, Warren Winfield. Newton. 337 Washington St.
1897 Martel, Stanislaus.........Lynn. Office, Boston. 362 Commonwealth Av.
1897 Martin, Archibald Herbert. Lynn. 29 Broad St.
1916 Martin, David Lorenzo....Dorchester (Boston). Office, Boston. 419 Boylston St.
1913 Martin, Edward............Roxbury (Boston). 246 Warren St.
1917 Martin, George Forrest....Lowell. 226 Central St.
1913 Martin, Harold Winthrop..Roxbury (Boston). 106 Warren St.
1898 Martin, Harry Charles....Springfield. 374 Main St.
1913 Martin, John Foley........Brookline. 1647 Beacon St.
1902 Marvell, Mary Wilbur.....Fall River. 243 Highland Av.
1916 Marvin, Frank William... Office, Boston. 520 Commonwealth Av.
1884 Mason, Atherton Perry....Fitchburg. 102 Rollstone St.
1914 Mason, Broadstreet Henry. Worcester. State Hospital.
1913 Mason, Gilbert McClellan..Dorchester (Boston). Office, Boston. 1109 Boylston St.
1902 Mason, Nathaniel Robert...Boston. 483 Beacon St.
1920 Mason, William...........Fall River. Office, Boston. Mass. Gen. Hosp.
1907 Massé, John Baptiste......Lawrence. 96 Bradford St.
1900 Masten, Charles Howard...Worcester. 919 Main St.
1876 Mather, Edward Elias †1910 Williamstown.
1906 Mather, John Adams......Colrain. Box 49.
1907 Mathes, Roy Wentworth...Lynn. 32 Chestnut St.
1910 Mathews, Robert Francis..Worcester. 390 Main St.
1915 Mathewson, Frank Weeden New Bedford. 99 Clinton St.
1879 Matte, Joseph Hubert Ambrose †1914 North Adams. 82 Church St.
1909 May, George Elisha.......Newton Center (Newton). 661 Commonwealth Av.
1916 May, James Vance........Dorchester (Boston). State Hosp.
1899 May, John Shepard........Roxbury (Boston). 495 Warren St.
1905 Mayberry, Frank Eugene...Pittsfield. 184 North St.
1916 Mayers, John Edward.....Santa Monica, Calif. 1st Natl. Bk. Bldg. Ocean Park.
1902 Mayhew, Orland Smith....Vineyard Haven (Tisbury).
1896 McAdams, James Philip...Lowell. 295 Central St.
1910 McAdams, Peter Stephens..Cambridge. Office, Boston. 1075 Boylston St.
1905 McAllester, Ralph William. Everett. 153 Linden St.
1899 McAllister, Frederick Danforth Methuen. Office, Lawrence. 301 Essex St.
1906 McArdle, John Joseph.....Lawrence. 477 Essex St.
1902 McBain, William Hearst...Malden. 456 Pleasant St.
1897 McCabe, John Joseph......Holyoke. 187 Chestnut St.
1905 McCaffrey, Charles Francis. Somerville. 44 Summer St.
1913 McCann, Charles Daniel...Brockton. 28 Main St.
1915 McCann, Gertrude Fisher..New York City. 1273 Lexington Av.
1917 McCarthy, Charles Daniel. Malden. 96 Summer St.
1897 McCarthy, Charles Florence Winchester. 452 Main St.
1892 McCarthy, Eugene Allan...Cambridge. 5 Bigelow St
1908 McCarthy, Eugene Ambrose Fall River. 132 Franklin St.
1908, 1916 McCarthy, Eugene Justin. Malden. 17 Garnet St.

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| 1906 | McCarthy, Francis Patrick | Milton. Office, Boston. 394 Marlboro St. |
| 1907 | McCarthy, Louis Flurence | Malden. 56 Summer St. |
| 1897 | McCarthy, Thomas Francis | Marlborough. Cotting Av. |
| 1890 | McCarthy, Thomas Horatio | Brockton. 142 Main St. |
| 1906 | McCarthy, Timothy Francis | Jamaica, N. Y. 5 Ray St. |
| 1916 | McCartin, John Edward | Boston. 141 Milk St |
| 1917 | McCarty, Edward Michael | Somerville. 30 Walnut St. |
| 1878 | McCarty, James Joseph | Lowell. 574 Central St. |
| 1904 | McCausland, William James | Quincy. 123 Franklin St. |
| 1875 | McClean, George Chesley †1916 | Springfield. 156 Pearl St. |
| 1917 | McClintock, Elsie | New York City, N. Y. 521 West 11th St. |
| 1912 | McClintock, Francis Blake | Chelsea. 27 Crescent Av. |
| 1919 | McClure, Charles Walter | Boston. 483 Beacon St. |
| 1911 | McCluskey, Richard John | Lowell. 40 Middlesex St. |
| 1908 | McClusky, Henry Lincoln | Worcester. 7 Hawthorne St. |
| 1912 | McConnell, David James | Greenfield. James' Extension. |
| 1875 | McCormick, Cornelius Joseph | Waltham. 825 Main St. |
| 1906 | McCormick, John Joseph | San Antonio, Texas. 1908 River Av. |
| 1907 | McCready, Leo Thomas | Jamaica Plain (Boston). 2 Peter Parley Rd. |
| 1911 | McCreery, Clarence Charles | Fall River. 151 Rock St. |
| 1919 | McCrudden, Francis Henry | Roxbury (Boston). R. B. Brigham Hosp. |
| 1919 | McDavett, James John | Worcester. 20 Portland St. |
| 1900 | McDermott, Joseph Edward | Charlestown (Boston). 296 Bunker Hill St. |
| 1898 | McDermott, William Vincent | Salem. 6 Brown St. |
| 1903 | McDonald, James William | Worcester. 507 Main St. |
| 1920 | McDonald, John Francis | Lynn. 301 Essex St. |
| 1902 | McDonald, Samuel James | Boston. 362 Commonwealth Av. |
| 1899 | McDonald, William Joseph | Brookline. 47 Garrison Rd. |
| 1900 | McEvoy, George Albert | Dorchester (Boston). Office, Boston. 483 Beacon St. |
| 1894 | McEvoy, Thomas Edward | Worcester. 37 Portland St. |
| 1898 | McFee, William David | Haverhill. 3 Washington Sq. |
| 1914<br>1919 | McGann, Pierce Powers | Boston. 307 Beacon St. |
| 1886 | McGannon, Thomas Gerald | Lowell. 105 Nesmith St. |
| 1903<br>1919 | McGauran, George Daniel | Newburyport. 57 Federal St. |
| 1891 | McGauran, Michael Sheridan | Lawrence. 266 Broadway. |
| 1900 | McGee, Fanny Maria | Waban (Newton). 765 Chestnut St |
| 1893 | McGillicuddy, John Timothy | Worcester. 340 Main St. |
| 1904 | McGillicuddy, Richard Aloysius | Turner's Falls (Montague). 107 Avenue A |
| 1914 | McGinity, Joseph Taney | Springfield. 293 Bridge St. |
| 1909 | McGinley, Michael Charles | Ipswich. Central St. |
| 1900 | McGirr, Felix Francis | Cambridge. 1436 Cambridge St. |
| 1898 | McGrath, Bernard Francis | Milwaukee, Wis. Marquette School. Med |
| 1919 | McGrath, John Edward | Hudson. 10 Maple St. |
| 1912 | McGraw, Andrew James | Taunton. 93 Washington St. |
| 1919 | McGuire, Lee Wesley | Boston. 375 Commonwealth Av. |
| 1914 | McIntire, Frederic Joseph | Lynn. 63 North Common St. |
| 1882 | McIntire, Herbert Bruce | Cambridge. 4 Garden St. |
| 1908 | McIntyre, George Francis | Boston. 69 Bay State Rd. |
| 1909 | McKallagat, Peter Leo | Lawrence. 301 Essex St. |
| 1915 | McKechnie, Frederick Joseph | Springfield. 317 Main St. |
| 1897 | McKeen, Sylvester Forshay | Allston (Boston). 556 Cambridge St. |
| 1912 | McKelvey, Alexander Dunbar | Toronto, Canada. 193 Bloor St., East. |
| 1892 | McKenna, Francis Patrick | Jamaica Plain (Boston). 382 Center St. |
| 1893<br>1912 | McKenzie, John Robert | Cambridge. 897 Mass. Av. |
| 1901 | McKibben, William Watson | Worcester. 390 Main St. |
| 1920 | McKittrick, Leland Sterling | Boston. 520 Commonwealth Av. |
| 1914 | McLaughlin, Arthur Otis | Haverhill. 120 Emerson St. |
| 1895 | McLaughlin, Henry Valentine | Brookline. 1459 Beacon St. |
| 1919 | McLaughlin, James Francis | Springfield. Springfield Hosp. |
| 1885 | McLaughlin, Joseph Ignatius | Roxbury (Boston). 92 Walnut Av. |
| 1910 | McLean, John Allan | West Somerville (Somerville). 16 Curtis St. |
| 1915 | McLellan, William Edwin | Lynn. 559 Western Av. |
| 1901 | McLeod, John Scott | Long Beach, Calif. R. F. D. L. |
| 1913 | McMahon, Francis Joseph | Brookline. 370 Washington St. |
| 1904 | McMann, William Henry | Jamaica Plain (Boston). 328 Center St. |
| 1900 | McMurray, Francis Michael | Fitchburg. 101 Prichard St. |
| 1888 | McNally, William Joseph | Roslindale (Boston). 46 Hewlett St. |
| 1903 | McNamara, John James | Brockton. 231 Main St. |
| 1898 | McNeish, Alexander | Leicester. Pleasant St. |
| 1882 | McOwen, William Henry | Newton Upper Falls (Newton). 280 Elliot St. |
| 1916 | McPeake, John Richard | Milton. 6 Blue Hills Parkway. |
| 1905 | McPherson, George Edwin | Medfield. State Hospital. |
| 1903 | McPherson, Ross | New York, N. Y. 125 East 39th. St. |
| 1909 | McQuade, Lewis Steele | Dorchester (Boston). 1081 Blue Hill Av. |
| 1898 | McQuaid, Thomas Bernard | Everett. 487 Broadway. |
| 1910 | McRae, Alexander John | Duluth, Minn. St. Luke's Hospital. |
| 1914 | McRobbie, Alexander | Lynn. 19 Central Sq. |
| 1905 | McSheehy, Theobald Coleman | Worcester. 86 Vernon St. |
| 1917 | McWilliams, Norman Beattie | Williamstown. |
| 1897 | Mead, Frederick Ammi | Willimansett (Chicopee). 984 Chicopee St. |
| 1892 | Mead, George Nathaniel Plummer | Winchester. 27 Church St. |
| 1903 | Mead, Louis Guy | Boston. 122 Marlboro' St. |
| 1920 | Meaker, Samuel Raynor | Boston. 784 Beacon St. |
| 1912 | Means, James Howard | Boston. 15 Chestnut St. |
| 1906 | Means, Philip Corydon | Santa Barbara, Calif. 1231 State St. |
| 1917 | Medalia, David Bernard | Fall River. Office, Boston. 483 Beacon St. |
| 1905 | Medalia, Leon Samuel | Boston. 483 Beacon St. |
| 1905 | Meehan, Patrick Joseph | Lowell. 228 Worthen St. |
| 1906 | Mehan, Joseph Aloysius | Lowell. 53 Central St. |
| 1920 | Meigs, Joe Vincent | Boston. Mass. Gen. Hosp. |
| 1894 | Meigs, Return Jonathan | Lowell. 226 Merrimack St. |
| 1920 | Melkonian, Eliza Armenoohi | Boston. 206 Huntington Av. |
| 1920 | Mella, Hugo | Cambridge. 20 Prescott St. |
| 1906 | Mellen, Eleanor Way Allen | Newton Highlands (Newton). 291 Lake Av. |
| 1920 | Melick, Joel Miller | Worcester. 771 Main St. |
| 1911 | Mellen, Harry George | Pittsfield. 150 North St. |
| 1905 | Mellus, Edward | Newton. 419 Waverley Av. |
| 1919 | Meltzer, Philip Edward | Dorchester (Boston). 2 Page St. |
| 1920 | Menard, Leon Joseph | Fall River. 199 Columbia St. |
| 1905 | Mendelsohn, Louis | Brookline. Office, Boston. 21 Bay State Rd. |
| 1894 | Mercer, William James | Pittsfield. 142 First St. |

1917 Meredith, Florence Lyndon Watertown. 3 Otis St.
1916 Mernin, Mary Towler.....Cambridge. 28 Blake St.
1899 Merriam, Franklin Henry..South Braintree (Braintree). 37 Holbrook Av.
1893 Merrick, Robert Michael..Dorchester (Boston). 18 Mt. Ida Road.
1914 Merrill, Adelbert Samuel..Hudson.
1905 Merrill, Ayres Philip......Pittsfield. 519 North St.
1916 Merrill, Charles Henry....Lynn. 64 Nahant St.
1917 Merrill, Clyde Harold.....Marlborough. 103 Mechanic St.
1915 Merrill, Everett Albert....Lynn. 212 Boston St.
1920 Merrill, Ralph Edward....Boston. City Hospital.
1896 Merrill, William Howe.....Lawrence. 301 Essex St.
1919 Merritt, Edward Lester....Fall River. 284 Bank St.
1918 Merritt, Robert Elmer.....Wollaston (Quincy).
1897 Merritt, Silas Virgil.......Fall River. 297 Osborn St.
1900 Merritt, Victor Sulviro....Springfield. 350 White St.
1915 Meserve, Edwin Alonzo....Allston (Boston). Office, Boston. 45 Bay State Rd
1918 Messier, Adlor Eugene.....Worcester. 1026 Main St.
1905 Messinger, Harry Carleton.Providence, R. I. 170 Broad St.
1896 Metcalf, Ben Hicks........Winthrop. 174 Winthrop St.
1913 Metcalf, Julia Tracy......Los Angeles, Calif. 1829 So. Grammercy Pl.
1914 Metcalf, Richard..........Winthrop. 114 Pleasant St.
1912 Metzger, Butler............Lynn. 41 Ocean St.
1919 Meunier, Raymond Royale.Indian Orchard (Spfld.). 304 Main St.
1914 Meyer, Edward James.... Somerville. 31 Warren Av.
1917 Meyers, Hyman Bernard..Chelsea. 174 Chestnut St.
1901 Middleton, Willis Johnson.Quincy. 446 Washington St.
1885 Mignault, Rodrigue........Lowell. 841 Merrimack St.
1920 Mikolaitis, Casimer John..Lawrence. 90A Lawrence St.
1909 Miles, Charles Gardner....Brockton. 23 Main St.
1893 Miles, George Albert......West Somerville (Somerville). 56 Chester St.
1892 Miller, Charles Herman...Dorchester (Boston). The Peabody, Ashmont St.
1877 Miller, Ernest Parker.....Fitchburg. 843 Main St.
1910 Miller, George Fremont....Boston. 132 Huntington Av.
1895 Miller, Lester Colwell.....Worcester. 14 Oxford St.
1909 Miller, Percy Farrington...N. Y. City. 600 W. 192d St.
1912 Miller, Richard Henry.....Boston. 402 Marlboro' St
1900 Miller, Samuel Osgood....Three Rivers (Palmer).
1880 Millet, Charles Sumner...Brockton. 23 Main St.
1913 Millett, Frank Albertus...Greenfield. 54 Federal St.
1898 Milliken, Charles Warren..New Bedford. Book Store Bldg.
1915 Mills, Alfred Ewing.......Somerville. 192 Central St.
1920 Mills, Chester Rudolph....Boston. City Hospital.
1920 Milot, Joseph Donat.......Fall River. 1100 Stafford Rd.
1900 Milot, Wilfrid François....Attleborough. 27 Bank St.
1919 Milward, Francis William, Jr. Boston. City Hosp.
1912 Mindlin, Carl.............Haverhill. 343 Washington St.
1915 Miner, Leroy Matthew Simpson Newtonville (Newton). Office, Boston. 153 Newbury St.
1916 Miniter, Francis Gabriel...South Boston (Boston). Office, Boston. 419 Boylston St.
1912 Minot, George Richards...Boston. 247 Beacon St.
1877 Minot, James Jackson.....Boston 188 Marlboro' St.
1896 Minshall, Arthur Gladstone Northampton. 16 Center St.
1918 Mintz, Samuel Charles.....Roxbury. Office, Boston. 419 Boylston St.
1893 Mitchell, Arthur..........Medfield.
1897 Mitchell, Harry Walter....Warren, Pa. State Hosp.
1901 Mitchell, William.........Needham Highlands (Needham).
1908 Mixter, Charles Galloupe..Boston. 180 Marlboro' St.
1881 Mixter, Samuel Jason......Boston. 180 Marlboro' St.
1907 Mixter, William Jason.....Boston. 180 Marlboro' St.
1909 Moeckel, Carl Richard....Lawrence. 443 Broadway.
1918 Moir, Marguerite Winifred Brookline. 71 St. Mary St.
1904 Moline, Charles............Sunderland.
1911 Monahan, Edward James..Somerville. Office, Boston. 645 Beacon St.
1914 Monahan, John Ambrose...Clinton. 181 Chestnut St.
1913 Moncrieff, William Armitage New Bedford. 17 South 6th St.
1894 Mongan, Charles Edward..Somerville. 24 Central St.
1880 Monks, George Howard....Boston. 51 Commonwealth Av.
1920 Monroe, Noel Gates......Southbridge. 10 Summer St.
1916 Montague, Charles Elbert..Wakefield. 15 Richardson Av.
1898, 1911 Moody, Flora Frost...Springfield. 77 Dartmouth St.
1911 Moore, Frederick Porter...Middleboro. 77 No. Main St.
1911 Moore, George Albert......Brockton. 167 Newbury St.
1915 Moore, George Andrew....Palmer. 353 Main St.
1904, 1914 Moore, George Colton.....Boston. 384 Commonwealth Av.
1913 Moore, Howard...........Newton. Office, Boston. 520 Beacon St.
1898 Moore, John Henry........Boston. 419 Boylston St.
1914 Moore, Mary Teresa Veronica Brighton (Boston). 1402 Commonwealth Av.
1901 Moore, Philip Patrick......Gloucester. 58 Middle St.
1903 Mooring, Scott Webber.....Gloucester. 738 Washington St.
1907 Moran, Charles Leo........U. S. Navy, Retired. Allston (Boston). 168 Allston St.
1911 Morgan, Charles Russell...Boston. 1091 Boylston St.
1903 Morgner, Richard August..Fitchburg. 914 Main St.
1917 Moriarty, John Joseph.....Danvers. 5 Page St.
1914 Moriarty, Patrick Maurice.Chicopee. 51 Center St.
1878 Morong, Arthur Bennett †1921 Boston. 12 Blackwood St.
1918 Morris, Abraham Samuel..Haverhill. 344 Washington St.
1891 Morris, George Patrick....South Boston (Boston). 811 Broadway.
1891 Morris, James Stewart.....Revere. 648 Beach St.
1889 Morris, John Gavin †1920 South Boston (Boston). 97 Broadway.
1873 Morris, Michael Augustine..Charlestown (Boston). Office, Boston. 390 Commonwealth Av.
1897 Morris, Richard Holt......Everett. 35 Corey St.
1907 Morrison, Archibald Benjamin Weeks' Mills, Me.
1910 Morrison, Hyman..........Dorchester (Boston). Office, Boston. 483 Beacon St.
1917 Morrison, Lawrie Byron..Boston. 370 Marlboro' St.
1908 Morrison, Robert Francia..Holyoke. 240½ Maple St.
1887 Morrison, William Alexander East Boston (Boston). 80 Princeton St.
1913 Morrison, William Reid....Boston. 527 Beacon St.
1892 Morrow, Charles Harvey...Gloucester. 46 Pleasant St.
1906 Morrow, William Robert...Framingham. 21 Irving St.
1898 Morse, Almon Gardner.....Hingham. Office, Boston. 421 Marlboro' St.
1892 Morse, Charles Ellsworth..Wareham. Main St.
1887 Morse, Frank Adelbert.....Lynn. 11 Lincoln St.
1896 Morse, Frank Leander.....Somerville. 78 Highland Av.
1885 Morse, Fred Harris........Jamaica Plain (Boston). Office, Boston. 462 Boylston St.
1910 Morse, George W...........Boston. 375 Commonwealth Av.
1878 Morse, Henry Lee..........Medfield. North St.
1910 Morse, Irene May..........Clinton. 153 Water St.
1890 Morse, John Lovett........Boston. 70 Bay State Rd.
1905, 1914 Morse, Nathaniel Niles. Mattapan. Office, Boston. 69 Newbury St.
1909 Morse, Roy Sydney........Ashland.
1898 Mosher, Harris Peyton....Boston. 828 Beacon St.
1914 Mosher, Marshall James...Waltham. 925 Main St.

1914 Mossman, George..........Westminster. 66 Main St.
1915 Mott, George Ernest.......Lynn. Gen. Electric Co.
1916 Moulton, Allen Thomas....Roxbury (Boston). Office, Boston. 483 Beacon St.
1909 Mudge, Otis Pope.........Amesbury. 152 Main St.
1913 Mulcahy, William Edward.Springfield. 820 State St.
1916 Muldoon, Mary Theresa...Somerville. 394 Broadway.
1919 Mulhern, Joseph Patrick...Worcester. 3 Perry Av.
1908 Mullen, Peter James.......Amesbury. 140 Main St.
1920 Mullen, Walter John......Springfield. 361 Belmont Av.
1919 Munro, Donald...........Boston. 19 Bay State Rd.
1884 Munro, Walter Lee........Providence, R. I. 189 Waterman St.
1901 Murdock, Frederick William Brockton. 56 West Elm St.
1920 Murphy, Albert Bernard..Boston. Long Isld. Hosp.
1908 Murphy, Anna Frances....Worcester. 5 King St.
1903 Murphy, Daniel David....Amebsury. 175 Main St.
1915 Murphy, Daniel Francis...Beverly Farms (Beverly). 28 Vine St.
1914 Murphy, Edward Frederick Roxbury (Boston). 1451 Tremont St.
1904 Murphy, Edward Martin...Lowell. 308 Nesmith St.
1900 Murphy, Edward Vincent..Newport. R. I. 118 Mill St.
1895 Murphy, Emily Frances....Taunton. 23 Summer St.
1904 Murphy, Frank Augustine..Taunton. 4 Fruit St.
1902 Murphy, Fred Towsley.....Detroit, Mich. 17620 Jefferson St., East.
1905 Murphy, Frederick Paul...Lowell. 16 Astor St.
1905 Murphy, Frederick Vincent. Attleborough. 51 Bank St.
1917 Murphy, Harold Alphonsus Jamaica Plain (Boston). 381 Center St.
1913 Murphy, John Joseph.....Cambridge. 2192 Mass. Av.
1920 Murphy, John Michael....Florence (Northampton). 80½ Maple St.
1882 Murphy, Joseph Briggs....Taunton. 23 Summer St.
1913 Murphy, Joseph Leroy.....Taunton. 48 Broadway.
1920 Murphy, Joseph William Patrick..Peabody. 28 Washington St.
1905 Murphy, Thomas William..Lawrence. 248 Broadway.
1898 Murphy, Timothy Joseph..Roxbury (Boston). Office, Boston. 520 Beacon St.
1910 Murray, Benjamin Frank..Jamaica Plain (Boston). Office, Boston. 6 Beacon St.
1920 Murray, Halstead Graeme.Framingham. 12 Larned St.
1910 Murray, Patrick Joseph....Dorchester (Boston). 162 Harvard St.
1908 1919 Myers, Edmund.........Boston. 591 Tremont St.
1907 Myers, Elizabeth Young...Springfield. 347 St. James Av.
1903 Myers, Samuel William....Boston. 34 McLean St.
1903 Myers, Solomon...........East Boston (Boston). 93 Lexington St.
1909 1919 Myerson, Abraham.... Dorchester (Boston). 138 Washington St.
1904 Myles, Leo Thomas........Cambridge. 1776 Mass. Av.
1910 Myrick, Alfred Winthrop..Randolph.
1901 Myrick, Hannah Glidden...Roxbury (Boston). N. E. Hospital.
1909 Mysel, Hymen Abraham...Haverhill. 310 Washington St.
1913 Mysel, Philip.............Boston. 20 Prince St.

## N

1919 Nash, Francis Joseph.....Boston. 350 Commonwealth Av.
1899 Nason, Arthur Clark......Newburyport. 194 High St.
1895 Nason, Osman Cleander Baker Sharon P. O. (East Foxboro). Box 23.
1919 Neill, Roberta Estella.....Springfield. 570 State St.
1903 Nelligan, John Patrick....Cambridge. 2336 Mass. Av.
1912 Nelson, Christian Augustus.Cambridge. 27 Clinton St.
1919 Nesmith, Francis Marion..Palmer. Monson State Hosp.
1908 Nettle, Paul..............Haverhill. 207 Groveland St.
1907 Nevers, Harry Hill........Lawrence. 246 Andover St.
1917 New, Way Sung..........Shanghai, China. 207 Babbling Well Rd.
1897 Newell, Franklin Spilman. Boston. 443 Beacon St.
1901 Newhall, Avery Lester....Lynn. 7 Vine St.
1909 Newhall, Harvey Field....Lynn. 51 Nahant St.
1886 Newhall, Herbert William. Lynn. 82 Broad St.
1886 Newhall, Lawrence Thompson Brookfield.
1899 Newton, Aaron Lewis......Northfield.
1914 Newton, Edward Roswell..Somerville. Office, Boston. 419 Boylston St.
1916 Newton, Frank Loomis Sabin Somerville. 34 Highland Av.
1908 Newton, Ralph Waldo.....U. S. Army.
1909 Newton, Roland Stephen...Westborough. 50 West Main St.
1898 Newton, William Curtis...Boston. 360 Commonwealth Av.
1870 Nichols, Arthur Howard †1911 Boston. 55 Mt. Vernon St.
1890 Nichols, Edward Hall.....Boston. 294 Marlboro' St.
1892 Nichols, John Holyoke....Tewksbury. State Infirmary.
1920 Nicholson, Minnie James Cantelo Haverhill. 79 Main St.
1884 Nickerson, George Wheaton Stoneham. 55 Central St.
1902 Nickerson, John Peter.....West Harwich (Harwich).
1911 Nield, William Andrew....New Bedford. 282 Pleasant St.
1899 Nielsen, Edwin Björne....Brookline. Office, Boston. 543 Boylston St.
1900 Nightingale, James........Worcester. 138 Franklin St.
1915 Nigro, Michele.............Chelsea. Frost Hospital.
1915 Niles, Edward Harry......Danvers. 66 Elm St.
1917 Niles, John Otis Garfield..Everett. 304 Ferry St.
1874 Nims, Edward Beecher †1903 Springfield. 40 Harvard St.
1916 Nissen, Harry Archibald..Boston. 205 Beacon St.
1895 Noble, Anngenette Fowler. Westfield. 21 Noble St.
1915 Noble, Ermy Corser.......Mattapan (Boston). State Hospital.
1906 Noble, Mary Gill..........Mattapan (Boston). State Hospital.
1902 Nolen, Walter Freeman....Boston. 535 Beacon St.
1911 Noonan, William Andrew..Cambridge. 770 Mass. Av.
1920 Norman, Samuel..........Malden. 241 Bryant St.
1914 Normand, Jean Napoleon...Fall River. 183 Hunter St.
1903 Norris, Albert Perley......Cambridge. 2 Garden St.
1916 Norris, Rolf Clarke.......Methuen.
1886 Norton, Eben Carver.... Norwood. 792 Washington St.
1903 Norton, George Edward...Cambridge. 1010 Mass Av.
1900 Norton, George Paul......Fitchburg. 24 Prichard St.
1910 Norton, Herbert Rozelle...Dorchester (Boston). 11 Bloomfield St.
1920 Nowell, Howard Wilbert...Boston. 416 Marlboro' St.
1908 Noyes, John Russell.......Brockton. 47 West Elm St.
1890 Noyes, Nathaniel Kingsbury Duxbury. Washington St.
1919 Nugent, Arthur John......Worcester. 19 Preston St.
1914 Nute, Albert James.......Boston. U. S. Immigration Station, Long Wharf.
1898 Nute, Marion.............Dorchester (Boston). Office, Boston. 483 Beacon St.
1917 Nutt, Walter Elwyn.......Methuen. 34 Lowell St.
1920 Nutter, Denton Gove......Waban (Newton). 108 Nehoiden Rd.
1903 Nye, Harry Royal........Leominster. 19 Lancaster St.

## O

1906 1916 Oak, Charles Arthur.....Lynn. 183 Franklin St.
1901 Ober, Frank Roberts......Boston. 234 Marlboro' St.
1904 Ober, Ralph Beverley.....Springfield. 76 Maple St.
1919 Oberg, Frank Thorwald...Worcester. 22 Pleasant St.

1912 O'Brien, Carl Robert......Bangor, Me. 6 State St.
1903 O'Brien, Charles Thomas..Woburn. 11 Pleasant St.
1905 O'Brien, Daniel Paul......New Bedford. 330 Union St.
1912 O'Brien, Edward Joseph...Brighton (Boston). Office, Boston. 543 Boylston St.
1911 O'Brien, Frederick William Boston. 430 Marlboro' St.
1917 O'Brien, John Charles.....Greenfield. 308 Federal St.
1903 O'Brien, John Francis.....Charlestown (Boston). Office, Boston. 520 Beacon St.
1911 O'Brien, John Francis.....Fall River. 319 Columbia St.
1911 O'Brien, John Francis ....Roxbury (Boston). 74 Fenwood Rd.
1905 O'Brien, Joseph Jeremiah..Dorchester (Boston). 2175 Dorchester Av.
1900 O'Brien, Thomas James...Boston. 501 Beacon St.
1902 O'Brien, Walter John Leo.Jamaica Plain (Boston). 218 South St.
1885 O'Callaghan, Mary Vincent Worcester. 137 Pleasant St.
1905 O'Connell, Andrew Edward Worcester. 518 Main St.
1919 O'Connor, Alfred Smith...Worcester. 22 Ledge St.
1893 O'Connor, James Bernard..Lowell. 188 Moore St.
1901 O'Connor, John Francis....Worcester. 11 Beechmont St.
1896 O'Connor, John Henry.....Hyde Park (Boston). 26 Oak St.
1910 1915 } O'Connor, Joseph William Worcester. Memorial Hosp.
1911 O'Connor, Patrick Henry..New Bedford. 240 County St.
1903 O'Day, George Frederick...Worcester. 390 Main St.
1919 O'Dea, Patrick Joseph.....Fitchburg. 22 Prichard St.
1916 Odeneal, Thomas Helm....Ancon, Panama. Ancon Hospital.
1881 O'Donnell, Francis Michael.Newton. 619 Washington St.
1912 O'Donnell, George Thomas.Springfield. 289 Main St.
1914 Oeser, Paul Richard.......Lawrence. 272 Jackson St.
1892 Ogden, Jay Bergen.........New York City, N. Y. 1 Madison Av.
1920 O'Hara, Dwight..........Waltham. 751 Main St.
1919 O'Hara, Francis James....North Adams. 9 Willow St.
1913 O'Hare, James Patrick.....Boston. 536 Commonwealth Av.
1908 O'Keefe, Abbie Mabel......Northampton. 33 Elm St.
1899 O'Keefe, Daniel Thomas...Jamaica Plain (Boston). 28 Glen Road.
1914 O'Keefe, Edward Scott.....Lynn. 31 Broad St.
1919 Olds, Frank William......Williamstown. Main St.
1907 O'Leary, Joseph Augustus..Wakefield. 16 Chestnut St.
1895 Olin, Francis Henry.......Southbridge. 27 Hamilton St
1912 Olin, Harry...............Roxbury (Boston). 444 Warren St.
1906 Oliver, Everard Lawrence..Boston. 488 Commonwealth Av.
1905 O'Malley, Edward Francis.Fitchburg. 30 Prichard St.
1913 O'Meara, John George.....Providence. R. I. 1547 Westminster St.
1920 O'Meara, John William....Worcester. 3 Linden St.
1891 O'Meara, Michael John.....Worcester. State Hospital.
1897 O'Neil, Richard Frothingham Boston. 374 Marlboro' St.
1916 Orcutt, Wallace Lyman....West Newbury. Main St.
1904 Ordway, Clarence Eugene..Winchester. 371 Main St.
1905 Ordway, Mabel Dyer.......Jamaica Plain (Boston). 6 Parley Vale.
1905 Ordway, Thomas..........Albany, N. Y. Albany Medical College.
1916 O'Reilly, Francis Augustine Lawrence. 249 Haverhill St.
1914 O'Reilly, William Francis..Lynn. 144 South Common St.
1919 Ormsby, Edward Bernard.Boston. City Hosp.
1914 O'Rourke, Edward James..Cambridge. 2280 Mass. Av.
1919 Osborn, Stanley Hart.....Hartford, Conn. 12 Vineland Terrace.
1902 Osborne, Caroline Amelia..Worcester. 52 May St.
1903 Osborne, Ernest Sumner...West Dennis (Dennis).
1905 Osgood, George...........Boston. 1015 Tremont Bldg.
1904 Osgood, George Edward....St. Petersburg, Fla. Box 186 R. F. D. L.
1892 Osgood, Gilman...........Rockland. 258 Union St.
1918 Osgood, Herman Ashton...Boston. 144 Commonwealth Av
1901 Osgood, Robert Bayley.....Boston. 372 Marlboro' St.
1911 O'Sullivan, Anna..........Boston. 175 Dartmouth St.
1899 O'Sullivan, John Joseph...Lawrence. 340 Haverhill St.
1876 Otis, Edward Osgood......Boston. 381 Beacon St.
1881 Otis, Walter Joseph........Boston. 267 Beacon St.
1909 O'Toole, John Laurence....Bradford (Haverhill). 112 Main St.
1894 Ott, George John..........Boston. 419 Boylston St.
1917 Overholser, Winfred .....Gardner. State Colony. East Gardner.
1913 Overlander, Charles Leonard Boston. 520 Beacon St.
1910 Overlander, John Eliot.....Springfield. 78 Maple St.
1876 Oviatt, George Alexander..South Sudbury (Sudbury).
1912 Owen, Albert Simpson.....Framingham. 44 Lincoln St.

## P

1895 Packard, Edward Albert...Boston. 908 Beacon St.
1916 Packard, Fabyan..........Graniteville (Westford).
1903 Packard, Frederic Henry...Waverley (Belmont). McLean Hospital.
1899 Packard, George Henry....White Rock, N. C.
1907 Packard, Horace...........Boston. 470 Commonwealth Av.
1913 Packard, Loring Bradford..Brockton. Prospect St.
1907 Paddock, Brace Whitman..Pittsfield. 7 North St.
1876 Paddock, William Le Roy..Pittsfield. 7 North St. †1916
1893 Page, Albert Kidder.......Boston. 339 Mass. Av.
1894 Page, Calvin Gates.........Boston. 128 Marlboro' St.
1870 1892 1909 } Page, Charles Whitney †1912 { Hartford, Conn. 94 Woodland St.
1898 Page, George Thornton.....Cambridge. 113 Inman St.
1892 Page, Hartstein Wendell...Baldwinsville (Templeton).
1898 Pagé, Joseph Gregory Elias Southbridge. 28 Hamilton St.
1917 Paglia, Jeremiah James, Jr.Worcester. 80 Shrewsbury St.
1919 Paige, Wilbur Myrtland...Lynn. 278 Western Av.
1905 Paine, Alonzo Kingman....Boston. 80 Bay State Road.
1867 Paine, Amasa Elliot †1920 Brockton. 463 Belmont Av.
1910 Paine, Harlan Lloyd.......Roxbury. 74 Fenwood Rd.
1908 Paine, Nathaniel Emmons..West Newton (Newton). 1640 Washington St.
1896 Painter, Charles Fairbank..Newton. Office Boston. 520 Commonwealth Av.
1904 Palfrey, Francis Winslow..Boston. 311 Beacon St.
1893 Palmer, Ezra.............Dorchester (Boston). 475 Columbia Rd.
1892 Palmer, George Monroe....Lynn. 25 Western Av.
1888 Palmer, Sarah Ellen.......Boston. 483 Beacon St.
1916 Papas, Prodromos NicholasBoston. 360 Commonwealth Av.
1917 Papen, George William....Boston. 205 Beacon St.
1905 Paquin, Joseph Ubalde.....New Bedford. 1306 Acushnet Av.
1901 Parcher, George Clarence...Saugus. 319 Central St.
1890 Park, Francis Edwin.......Stoneham. 350 Main St.
1918 Parker, Charles Clinton, Jr.Roxbury (Boston). 425 Warren St.
1904 Parker, Ernest Lawrence...Worcester. 575 Salisbury St.
1914 Parker, Frederick Daniel..Brookline. 1203 Beacon St.
1899 Parker, Ralph Walter.....Lowell. 220 Westford St.
1914 Parker, Raymond Brewer..Winthrop. 148 Winthrop St.
1893 1913 } Parker, Wallace Asahel. Dighton.

1899 Parker, Walter Henry......Dorchester (Boston). 1773 Dorchester Av.

1912 Parker, Willard Stephen...Boston. 483 Beacon St.

1919 Parkhurst, Albert Elisha..Beverly. 163 Cabot St.

1887 Parks, Silas Henry........West Stockbridge. Main St.

1892 Parmelee, William Josiah..Springfield. 108 Calhoun St.

1918 Parmenter, Derric Choate..East Gloucester (Gloucester).

1905 Parr, John..............Methuen. 7 Hampshire St.

1916 Parris, Roland Oliver......Brookline. Office, Boston. 636 Beacon St.

1880 } 1915 } Parsons, Azariah Worthington { Mexico City, Mexico. 15 Ave. Madero.

1887 Parsons, Frank Sears......Dorchester (Boston). 367 Adams St.

1915 Partington, Cyrus Brown...Denver, Colo. 14th and California Sts.

1914 Partridge, Thomas Jefferson Cambridge. 11 Magazine St.

1910 Parvey, Benjamin.........Dorchester (Boston). 24 Charlotte St.

1906 Pascoe, William Whelan...Adams. 67 Summer St.

1892 Patch, William Thurston..Roxbury (Boston). Office, Boston. 462 Boylston St.

1902 Patten, Stephen Kerr......Brookline. Office, Boston. 141 Milk St.

1905 Patterson, Alice Maria.....Wrentham. State School.

1900 Patterson, William Francis.Somerville. Office, Charlestown (Boston). 401 Main St.

1905 Pattrell, Arthur Ellis......North Grafton (Grafton). State Hospital.

1899 Paul, Luther Gordon.......Boston. 321 Beacon St.

1915 Paul, Socrates James.....Springfield, 549 State St.

1887 Paul, Walter Everard......Boston. 104 Marlboro' St.

1912 Pavlo, Samuel George.....Malden. 356 Ferry St.

1891 Payne, James Henry.......Allston (Boston). 1230 Commonwealth Av.

1907 Peabody, Francis Weld....Boston. P. B. Brigham Hosp.

1908 Pearce, Arthur Cushing....Brookline. Office, Boston 543 Boylston St.

1914 Pearce, George Girdwood..NewBedford. 18 Seventh St.

1912 Pearl, Samuel Maurice.....Boston. 67 Chambers St.

1902 Pearson, Charles Lusby....Newton. Office, Boston. 320 Commonwealth Av.

1891 Pearson, Maurice Wellesley Ware. 19 Pleasant St.

1899 Pease, Charles Wood......Needham. 20 Dedham Av.

1892 Pease, Edward Allen.......Westbrook, Conn.

1906 Pease, Lewis Waite........Weymouth. 65 Washington St.

1907 Peck, Roy Hamilton.......Springfield. 15 Temple St.

1907 Peirce, Bradford Hendrick. South Hanson (Hanson). Plymouth Co. Hosp.

1899 Peirce, George Alphonso...Tewksbury. State Infirmary.

1889 Peirson, Edward Lawrence. Salem. 13 Barton Sq.

1908 Pelletier, Alfred George....Winchendon. Maple St.

1920 Pelletier, William Joseph .. .. ..Brighton (Boston). 736 Cambridge St.

1913 Pemberton, Frank Arthur..Brookline. Office, Boston. 311 Beacon St.

1906 Penhallow, Dunlap Pearce..Address unknown.

1919 Penn, Henry Samuel.......Lawrence. 263 Haverhill St.

1903 Penny, Herbert Thomas...Cliftondale (Saugus). 26 Jackson St.

1911 Penny, Mary McDermott...Cliftondale (Saugus). 26 Jackson St.

1914 Percy, Karlton Goodsell....Brookline. Office, Boston. 520 Commonwealth Av.

1914 Perkins, Franklin Haskins. Wrentham. State School.

1907 Perkins, Harry Bradford...Haverhill. 125 Main St.

1919 Perkins, Ralph Sherburne.Worcester. 6 High St.

1914 Perkins, Roy Stanley......Lowell. Office, Boston. 520 Commonwealth Av.

1898 Perley, Roscoe Damon....Melrose. 63 West Emerson St.

1913 Perras, Louis Adélard.....New Bedford. 129 Ruth St.

1920 Perron, Albert Ernest......Fall River. 1101 So. Main St.

1885 Perry, Arthur Pedro......Jamaica Plain (Boston). Office, Boston. 419 Boylston St.

1911 Perry, Charles Eugene.....Haydenville (Williamsburg). Hampshire Co. Sanatorium.

1883 } 1891 } Perry, George Lewis †1919 Athol. 304 Main St.

1913 Perry, Harold Edgar......New Bedford. 331 Union St.

1896 Perry, Henry Joseph.......Boston. 45 Bay State Rd.

1891 Perry, Herbert Brainard...Northampton. 55 New South St.

1885 Perry, Martha †1913 New Bedford. 671 County St.

1908 Perry, Sherman...........Tewksbury. State Infir'y.

1920 Persons, Carl Clough......New Bedford. 9 No. Orchard St.

1913 Peter, Alphonse Joseph....Newburyport. 78 Middle St.

1919 Peterson, Arthur Fredolf..Brockton. 25 First St.

1892 Peterson, Charles Augustus Burton New Bedford. 44 State St.

1913 Peterson, Hugo Oliver.....Worcester. 44 Pleasant St.

1901 Peterson, John Adna.......Hingham.

1909 Pettey, John Anderson.....Brockton. 63 Main St.

1914 Pettingill, Olin Sewall.....Greenwood (Wakefield).

1919 Pettingill, Warren Martin.West Somerville (Somerville). 2 Curtis St.

1919 Pfeiffer, Albert............Boston 483 Beacon St.

1919 Phaneuf, Josephat Stanislas Policarpe Brockton. 688 No. Main St.

1913 Phaneuf, Louis Eusèbe.....Boston. 514 Commonwealth Av.

1892 Phelps, John Samuel.......Boston. 76 Commonwealth Av.

1907 Phelps, Olney Draper......Worcester. 452 Main St.

1892 Phelps, Olney Windsor †1914 Warren. Maple St.

1910 Philbrick, Roscoe Hunter..East Northfield (Northfield).

1901 } 1915 } Phillips, Charles Henry...Beverly. 376 Cabot St.

1920 Phillips, Frank Elmer.....North Chelmsford (Chelmsford).

1920 Phillips, Karl Tristram...Worcester. City Hospital.

1907 Phillips, Wilson Frank....Dorchester (Boston). 138 Norfolk St.

1887 Phippen, Hardy...........Salem. 84 Washington Sq.

1904 Phippen, Walter Gray......Salem. 31 Chestnut St.

1910 Phipps, Cadis.............Boston. 31 Mass. Av.

1880 Phipps, Walter Andros.....Wollaston (Quincy). †1919 308 Safford St.

1895 Pierce, Appleton Howe.....Leominster. 100 West St.

1887 Pierce, Frank Benneville..Haverhill. 132 Main St.

1898 Pierce, George Burgess.....West Orange, N. J. Llewellyn Park.

1882 Pierce, Matthew Vassar....Milton. Canton Av.

1886 } 1909 } Pierce, Willard Henry.. { Bernardston. Office, Greenfield. 191 Main St.

1908 Pierce-Higgins, Eudora....Taunton. 175 High St.

1886 Pigeon, James Cogswell Du Maresque Roxbury (Boston). 27 Elm Hill Av.

1905 Pike, Forrest Fay.........Melrose. 67 Wyoming Av.

1892 Pike, Forrest Wiley........Portsmouth, N. H. 4 Pleasant St.

1901 } 1906 } Pike, Winfred Carle......Boston. 82 Huntington Av.

1916 Pillsbury, Arthur Russell. Allston (Boston). 16 Idlewild St.

1900 Pillsbury, Boyden Harlin..Lowell. 267 Nesmith St.

1897 Pillsbury, Ernest Dean....West Somerville (Somerville). 14 Fairmount Av.

1909 Pillsbury, Fitzroy Farnsworth Lowell. 201 Princeton St.
1870 Pillsbury, George Harlin †1920 Lowell. Rivercliff Rd.
1919 Pillsbury, Nahum Roy....So. Braintree (Braintree). Norfolk Co. Hosp.
1869 Pinkham, Joseph Gurney...Lynn. 64 Nahant St.
1895 Piper, Frank.............Boston. 130 Bowdoin St.
1910 Piper, Fred Smith.........Lexington. 20 Clark St.
1885 Pitcher, Herbert Frank.... Haverhill. †1919 50 Merrimack St
1901 Pitta, Joao Carlos da Silva. New Bedford. 57 Allen St
1907 Place, Edwin Hemphill.... Boston. 745 Mass. Av
1899 Place, Ralph Waldo........Somerville. 165 Medford St
1907 Playse, Linn Foss..........Hopkinton. 14 Church St.
1919 Plouffe, Bernard Louis....Webster. 395 Main St.
1890 Plummer, Edward Maverick Charlestown (Boston). 5 Adams St.
1906 Plunkett, Harold Brabazon. Lowell. 282 Andover St.
1919 Pobirs, Louis Jacob.......New Bedford. 1208 Acushnet Av.
1907 Pofcher, Elias Harry......Worcester. 60 Green St.
1915 Poirier, George Henri......Boston. 394 Marlboro' St.
1903 Poirier, Horace...........Salem. 173 Lafayette St.
1920 Polak, Isaac Benjamin....Springfield. 172 Main St.
1917 Pollock, Henry Meeker....Boston. Mass. Hom. Hosp.
1900 } 1919 } Pomeroy, Harris Starr.... Peabody. 93 Main St.
1902 Pond, Bernard Wesley.....Boston. 180 Huntington Av.
1908 Pond, Lucius Beverly......Easthampton. 115 Main St.
1886 Pope, Emily Frances.......Boston. 163 Newbury St. †1919
1887 Pope, Frank Fletcher......Ashby.
1911 Popoff, Constantine........Haverhill. 26 Summer St.
1892 Porter, Charles Allen......Boston. 116 Beacon St.
1916 Porter, Charles Terrell....Waltham. Office, Boston. 520 Commonwealth Av.
1873 } 1877 } Porter, Frank Edward.. †1916 { Auburndale (Newton). 409 Auburn St.
1903 Porter, Robert Brastow....North Easton (Easton). 3 Day St.
1919 Porter, William James....Winthrop. 562 Shirley St.
1870 Post, Abner..............Boston. 16 Newbury St.
1904 Pote, Leonard Holden......Somerville. 375 Broadway.
1889 Pothier, Joseph Charles.... New Bedford. 175 Purchase St.
1901 Potter, Alexander Carleton. Cambridge. Office Boston. 520 Commonwealth Av.
1896 Potter, Frances Wason.....Framingham. 11 Lexington Av.
1907 Potter, John Claude.......Framingham. Franklin and Pearl Sts.
1899 Potter, Lester Forest.......New Bedford. 278 Union St.
1898 Potts, Joseph Henry.......Holyoke. 143 Chestnut St.
1919 Powell, Charles Austin....Chao Hsien, China. *via* Wuku.
1908 Powell, Maud Agatha......Laconia N. H.
1912 Power, George Aloysius.... Worcester. 7 Vernon St.
1909 Powers, Edward Parnell...Roxbury (Boston). 664 Huntington Av.
1905 Powers, George Herman... Boston. 298 Marlboro' St.
1905 Powers, H. Hale..........Brookline. 68 Davis Av.
1916 Powers, William Joseph...Holyoke. 165 Lincoln St.
1910 Praino, Gaetano........... South Boston (Boston). 273 Broadway.
1868 Pratt, Calvin †1908 Bridgewater. South St.
1894 Pratt, Charles Augustus...New Bedford. 60 Orchard St.
1908 Pratt, David Damon.......New Bedford. 118 Cottage St.
1915 Pratt, Emily Adelaide.....Roxbury (Boston). 51 Moreland St.
1913 Pratt, Ezekiel............Arlington. 374 Mass. Av.
1892 Pratt, John Washburn.....Dedham. St. Paul. Sq.
1898 Pratt, Joseph Hersey.......Boston. 317 Marlboro St.
1908 Pratt, Mason Ross.........Canton, Ohio. Aultman Hospital.
1884 Preble, Wallace...........Cambridge. 22 Appian Way.
1910 Preble, William Emerson...Boston. 416 Marlboro' St.
1908 Prenn, Joseph............Roxbury. Office, Boston. 536 Commonwealth Av.
1886 Prescott, William Herbert..Forest Hills (Boston). 330 Hyde Park Av.
1915 Price, Oscar Jay..........Somerville. 345 Highland Av.
1901 Priest, Herbert Bancroft...Ayer. Washington St.
1907 Prince, Calvin Oliver......Plymouth. 272 Court St.
1861 } 1866 } Prince, James Perrott †1902 { Durban, Natal, South Africa.
1879 Prince, Morton...........Boston. 458 Beacon St.
1881 Prior, Charles Edwin......Malden. 1 Mountain Av.
1903 Pritchard, William Percival Fall River. 273 North Main St.
1891 Proctor, Francis Ingersoll.. Wellesley. Office, Boston. 64 Commonwealth Av.
1898 Proctor, Joseph Whipple...Malden. 235 Clifton St.
1894 Proctor, Percy Clement....Gloucester. 40 Middle St.
1900 Provandie, Paul Hector....Melrose Highlands (Melrose). 88 West Emerson St.
1914 Provost, Raoul Gaston.....New Bedford. 474 County St.
1912 Pulsifer, Nathan..........Lowell. 258 Merrimack St.
1910 Pulsifer, Walter Hall......Whitman. 26 Park Av.
1906 Purvis, Charles Burleigh †1910 Brookline. 1455 Beacon St.
1919 Putnam, James Jackson...Boston. 106 Marlboro' St.
1877 Putnam, Joseph Morrill....Chelsea. West Medford †1917 (Medford). 62 Austin St.
1902 Putnam, Ralph...........Winchester. 127 Main St.
1894 Putnam, Willard Abram...Cambridge. 16 Garfield St.

## Q

1886 Qua, Lester Robert........Pepperell. Main St.
1890 Quackenboss, Alexander....Boston. 143 Newbury St.
1913 } 1917 } Quennell, Willard Leslie { Highland Park, Mich. H. P. Gen. Hosp.
1905 Quessey, Alfred Henry.....Fitchburg. 64 Prichard St.
1909 Quest, James Francis......Boston. 176 Huntington Av.
1869 Quinby, Hosea Mason †1911 Worcester 656 Main St.
1903 Quinby, William Carter....Brookline. Office, Roxbury (Boston) P. B. Brigham Hospital.
1916 Quinn, James Henry......Springfield. 300 Dickinson St.

## R

1898 Rabe, Edith Ruth Meek Boston. 481 Beacon St.
1914 Rabinovitz, Bernard.......Springfield. 482 Chestnut St.
1912 Rackemann, Francis Minot. Milton. Office, Boston. 263 Beacon St.
1920 Raeder, Oscar Jacob...... Neuilly-sur-Seine. Amer. Hosp.. 44 Rue Chateau.
1917 Rafferty, Thomas Bernard. Lynn. 120 So. Common St.
1920 Ragle, Benjamin Harrison. Brookline. Office, Boston. 226 Marlboro' St.
1920 Raleigh, Walter Melvin...Springfield. 38 Main St.
1892 Rand, John William.......Amesbury. 108 Main St. †1919
1896 Rand, Richard Baxter.....North Abington. (Abington).
1897 Randall, Clifford Walcott.. Worcester. 723 Main St.
1920 Randall, Guy Charles.....Lowell. 97 18th St.
1915 Rapoport, Boris..........Roxbury (Boston). 38 Columbia Rd.
1896 Rawson, George Wallace... Amherst. 27 Main St.
1907 Raymond, Charles Stanley. Waverley (Belmont). Box C, Sch. Feeble-Minded.
1908 Raymond, Katharine Piatt. Wellesley. Wellesley College.
1904 Raymond, Loring Hay..... Somerville. 76 Highland Av.

1902 Raynes, Myrton Berry.....Melrose. 42 West Emerson St.
1899 Reagh, Arthur Lincoln.....West Roxbury (Boston). 39 Maple St.
1905 Reardon, Daniel Bartholomew Quincy. Office, Boston. 220 Clarendon St.
1893 Reardon, Timothy Joseph..Boston. 76 Commonwealth Av.
1917 Record, Harold Roland....East Braintree (Braintree).
1920 Redden, William Rufus...Boston. 409 Marlboro' St.
1896 Reddy, Joseph Warren.....No. Reading. State Sanatorium.
1892 Redmond, James William..South Boston (Boston). 512 Broadway.
1907 Redmond, Thomas Henry..Lawrence. 256 Haverhill St.
1917 Reed, Carlisle ............Boston. 155 Mass. Av.
1908 Reed, Laurence Bradford..Plymouth. 20 North St.
1898 Reed, Victor Augustus.....Methuen. Office, Lawrence. 477 Essex St.
1883 Reed, William Gilman.....Southbridge. 2 Hamilton St.
1910 Reese, John Arnold........Attleborough. 2 Sanborn Bld'g.
1916 Reeves, Marcellus.........Boston. 1069 Boylston St.
1913 Regan, James Joseph......Dorchester (Boston). Office, Boston. 536 Commonwealth Av.
1920 Regan, William Francis...Chelsea. Office, Boston. 19 Bay State Rd.
1912 Reggio, André William....Boston. 286 Beacon St.
1907 Reid, Isadore Eugene Rosenstein Jamaica Plain (Boston). Office, Boston. 8 Beacon St.
1910 Reid, William Duncan.....Boston. 510 Commonwealth Av.
1900 Reilly, James Aloysius.....Dorchester (Boston). 1675 Dorchester Av.
1911 Reilly, Thomas Edward....Marlborough. 6 Newton St.
1919 Resnik, Joseph...........Dorchester (Boston). 566 Blue Hill Av.
1884 Reynolds, Edward.........Boston. 321 Dartmouth St.
1889 Reynolds, Henry Vose......Brookline.
[illegible] 112 Salisbury Rd.
1913 Reynolds, Ralph Leavitte..Waterville, Me. 207 Main St.
1866 Rice, Albert Raymond †1906 Springfield. 36 Temple St.
1906 Rice, Allen Galpin.........Springfield. 33 School St.
1917 Rice, Florence Frances....Cambridge. 19 Pleasant St.
1893 Rice, Frederick Winslow...Brighton (Boston). 16 Elko St.
1919 Rice, George Arnold.......Holden.
1908 1919 Rice, Herbert Augustus.Canton.
1908 Rice, John Evarts......... Worcester. 390 Main St.
1920 Rice, Robert..............Haverhill. 3 Washington Sq.
1903 Rice, Robert Astley........Fitchburg. 12 Prichard St.
1896 Rice, Walter Henry........Boston. 290 Newbury St.
1903 Rich, Charles Edwin......Lynn. 65 Broad St.
1913 Richards, Cyril Godfrey....Boston. 46 Gloucester St.
1893 Richards, George Lyman...Fall River. 124 Franklin St.
1920 Richards, Thomas Kinsman Boston. 520 Commonwealth Av.
1891 Richardson, Anna Gove....Boston. 22 Evans Way.
1903 Richardson, Charles Harper Pittsfield. 346 North St.
1907 Richardson, Cheslie Alvah Clarence West Somerville (Somerville). 731 Broadway.
1908 Richardson, Edward Peirson Boston. 224 Beacon St.
1904 Richardson, Frank Linden..Boston. 543 Boylston St.
1906 Richardson, Horace Kimball Nashua, N. H. 296 Main St.
1919 Richardson, Ira Walter....Wakefield. 21 Yale Av.
1896 Richardson, Mark Wyman..Jamaica Plain (Boston). Office, Boston. 67 Milk St, Room 23.
1913 Richardson, Oscar.........Boston. Mass. Gen. Hosp.
1867 Richardson, William Lambert Boston. 225 Commonwealth Av.
1895 Richmond, Ernest Dalton..Reading. 24 Woburn St.
1898 Richmond, Simon..........Roxbury (Boston). 271 Humboldt Av.
1918 Ricker, Carroll Henry.....Worcester. 25 Portland St.
1914 Riemer, Hugo Bruno Charles Norwood. Office, Boston. 220 Clarendon St.
1911 Riggs, Austen Fox.........Stockbridge. Main St.
1910 Riley, Augustus............Boston. 868 Beacon St.
1907 Riley, Charles Allen.......Allston (Boston). 1267 Commonwealth Av.
1900 Riley, Elizabeth Angela....Boston. 45 Bay State Rd.
1906 Riley, John Henry.........North Adams. 103 Main St
1898 Ring, Arthur Hallam......Arlington Heights (Arlington).
1918 Ring, Arthur Joseph.......Lynn. 145 No. Common St.
1917 Riordan, Arthur Hatton...Indian Orchard (Springfield). 150 Main St.
1906 Riordan, Walter Daniel....Lawrence. 187 Newbury St.
1883 Ripley, Frederick Jerome..Brockton. 12 Cottage St.
1917 Ripley, Harold William...Braintree. 400 Washington St.
1904 Ripley, Horace Greeley....Taunton. State Hospital.
1903 Ripley, William Littlefield.Brighton (Boston). 19 Oak Sq. Av.
1904 Ritter, Henry............. Springfield. 660 Chestnut St.
1906 Roach, Alfred John........So. Braintree (Braintree). Norfolk Co. Hosp.
1915 Robb, Hunter.............Winchester. 55 Bacon St.
1906 Robbins, Chandler........Weston.
1918 Robbins, Edmund Henry...Somerville. 174 Broadway.
1901 Robbins, Elmer Ellsworth..New Bedford. 240 Hawthorne St.
1907 Robbins, Eugene Stanley...New Bedford. 240 Hawthorne St.
1891 Robbins, Fred Gibson......Salem. Office, Boston. 129 Marlboro' St.
1906 Robbins, William Bradford.Boston. 355 Marlboro' St.
1897 Roberts, Frederick Alpha..Pittsfield. 230 North St.
1920 Roberts, Harry Lewis.....Springfield. 206 High St.
1895 Roberts, Linneus Alton.....Dorchester (Boston). 699 Washington St.
1911 Robertson, Ewan Alexander Lowell. 295 Central St.
1914 Robertson, Jessie Wilhelmine Cambridge. 2261 Mass. Av.
1895 Robey, William Henry, Jr...Boston. 202 Commonwealth Av.
1900 Robie, Alice Hatheway Purvis Cambridge. 36 Fresh Pond Parkway.
1898 Roble, Walter Franklin....Baldwinsville (Templeton). Pine Terrace Sanatorium.
1914 Robins, Samuel Alexander.Roxbury. 489 Warren St.
1920 Robinson, Bernard Herman Roxbury (Boston). 121 Blue Hill Av.
1914 Robinson, Henry Ashton...Hingham. South St.
1888 Robinson, Lucy Morton †1915 Brockton. 28 Glenwood St.
1890 Robinson, Thomas Johns...Taunton. 56 Broadway.
1893 Robinson, William Henry..Jamaica Plain (Boston). 409 South Huntington Av
1895 Robinson, William Perry...Haverhill. 1403 Broadway.
1883 1898 Roche, Thomas Francis...Blackstone.
1908 Roche, Thomas Neil.......New Bedford. 279 County St.
1904 Rochette, Edward Charles..Worcester. 20 Portland St.
1915 Rochford, Grace Elizabeth.Roxbury (Boston). 61 Parker Hill Av
1914 Rochford, Richard Augustine Springfield. 175 State St.
1920 Rock, John Charles.......Boston. 371 Marlboro' St.
1901 Rockwell, Alfred Elijah Perkins Worcester. 248 Main St.
1901 Rockwell, Herbert George.Amherst. 25 Main St.
1917 Rockwell, John Arnold, Jr..Cambridge. 24 Garden St.
1919 Rockwell, Llewellyn Harrison Roxbury (Boston). 87 Moreland St.
1912 Rockwell, Lucy Wetherbee Worcester. 2 King St.
1919 Rockwood, Ethel May.....Worcester. 61 Pearl St.
1914 Roderick, Charles Elvin....Wrentham. State School.

1914 Rodger, James Yeams.....Lowell. 226 Central St.
1903 Rodrick, Albert Fowler....Beverly. 3 Hale St.
1920 Roe, John Cornelius......Pittsfield. 184 North St.
1890 Rogers, Albert Edward.....Boston. 261 Beacon St.
1909 Rogers, Edmund Augustus. Allston (Boston). 1242 Commonwealth Av.
1883 Rogers, Frank Alvin †1920 Everett. 534 Broadway.
1914 Rogers, John Andrews.....Nashua, N. H. 63 Main St
1906 Rogers, Mark Homer......Belmont. Office, Boston. 483 Beacon St.
1873 Rogers, Orville Forrest †1920 Dorchester (Boston). 465 Washington St.
1890 Rolfe, William Alfred.....Boston. 330 Dartmouth St.
1902 Rollins, Edwin Theodore...Jamaica Plain (Boston). 17 Gordon St.
1916 Roney, Hugh Beverly.....Pittsfield. 130 East Housatonic St.
1910 Rood, Adolphus Duncan...Springfield. Am. Bosch Magneto Corp.
1907 Rood, Luther Colby.......Dorchester (Boston). Office, Boston. 419 Boylston St.
1914 Root, Raymond Richmond. Georgetown. 7 Pleasant St.
1868 Root, Richmond Barbour... †1917 Georgetown. 24 North St.
1902 Rose, William Henry......Worcester. 13 Elm St.
1904 Rose, William Milton......Cambridge. 230 Prospect St.
1910 Rosen, David William......Boston. 321 Hanover St.
1919 Rosen, Edward............Revere. 164 Shirley Av.
1920 Rosen, Kermit Charles....Dorchester (Boston). 973 Blue Hill Av.
1911 Rosenau, Milton Joseph.... Brookline. Office, Roxbury (Boston). 240 Longwood Av.
1907 1910 1914 Rosenbloom, Carl Webber. Holyoke. 348 Dwight St.
1917 Ross, Elizabeth ..........Melbourne, Australia. Hom. Hosp., St. Kilda.Rd.
1914 Rothblatt, Harry Lewis....Boston. 13 Allen St.
1907 Roughan, Charles Michael..Lowell. 29 Bridge St.
1885 Round, Arthur Morey......Norton. Taunton Av.
1914 Rounseville, Wilfred Ellsworth Attleborough. 40 Bank St.
1906 Rowe, Carleton Allen......Milton. 454 Adams St.
1920 Rowe, Frank Elmer.......Revere. 221 Broadway.
1920 Rowe, Leonard Blake.....Natick. 27 W. Central St.
1892 Rowen, Henry Stanislaus..Brighton (Boston). Office, Boston. 520 Beacon St.
1920 Rowland, William Denton. Lynn. Office, Boston. 220 Clarendon St.
1918 Rowley, Philip William....Gloucester. 27 Middle St.
1897 Rowley, William..........Lanesville (Gloucester). 1087 Washington St.
1906 Roy, Joseph Napoleon.....Webster. 74 Main St.
1895 Royal, Herbert Benjamin Harvard. Still River Rd.
1908 1915 Rubin, Solomon Hyman... Roxbury (Boston). 582 Blue Hill Av.
1916 Ruble, Wells Allen........Melrose. N.E. Sanatorium.
1920 Rudman, Benjamin William Boston. 68 Bay State Rd.
1913 Ruel, Joseph Adjutor......Haverhill. 14 Main St.
1919 Ruggles, Edwin Pakenham. Dorchester (Boston). 430 Washington St.
1920 Ruggles, Ralph Hastings..Boston. 308 Commonwealth Av.
1905 Rumrill, Samuel Dudley...Springfield. 46 Main St.
1906 Rushford, Edward Allan...Salem. 175 Lafayette St.
1908 Rushmore, Stephen........Boston. 520 Commonwealth Av.
1899 Russell, Simon James......Springfield. 154 Chestnut St.
1905 Russell, Walter Burton....Springfield. 796 State St.
1904 Ruston, Warren Dunn......West Somerville (Somerville). 744 Broadway.
1886 Ryan, Dennis Matthew.....Ware. 38 Pleasant St.
1910 Ryan, Sylvester Edward...Springfield. 13 Hancock St.
1912 Ryan, William Francis.....Lowell. 219 Central St.
1913 Ryan, William Patrick.....Holyoke. 185 Chestnut St.
1914 Ryder, Bernadette McWeeny Boston. 483 Beacon St.
1906 Ryder, Delano Richmond...Fall River. 151 Rock St.
1901 Ryder George Hale........Quincy. Office, Boston. 143 Newbury St.
1882 Ryder, Godfrey............Malden. 321 Pleasant St.

## S

1873 Sabine, George Krans......Brookline. 30 Irving St.
1898 Sabine, Jane Downes Kelly. Boston. 348 Marlboro' St.
1911 Sadler, Roy Angelo........Boston. 652 Mass. Av.
1915 Safford, Moses Victor......Jamaica Plain (Boston). 15 Grovenor Rd.
1904 Safford, Wilber Pray......Brockton. 52 Pleasant St.
1895 St. Clair, Austin Emery....Framingham. 63 Concord St.
1894 St. Denis, Joseph Nelson...Roslindale (Boston). 52 Lorraine St.
1893 St. Germain, Joseph Pierre. New Bedford. 23 Page St.
1898 1917 St. Marie, Phillipe.......Taunton. 72 Broadway.
1912 Salles, John Murray.......New Bedford. 113 Grinnell St.
1919 Salmon, Charles Augustus. Worcester. 236 Main St.
1916 Saltz, Sidney Myer.......Boston. 113 Chambers St.
1909 Sanborn, Byron............Topsfield. Central St.
1876 Sanborn, Edwin Aaron †1915 Somerville. 24 Franklin St.
1902 Sanborn, George Phippen.. Boston. 320 Commonwealth Av.
1897 Sanborn, John Wesley..... Roxbury (Boston). 168 Humboldt Av.
1881 Sanborn, Perley Lewis.....Marblehead. 79 Pleasant St.
1870 Sanders, Charles Barton †1909 Lowell. 475 Westford St.
1920 Sanders, Morris Blackman. Boston. Mass. Gen. Hosp.
1920 Sandler, Frank Fischel....Revere. 56 Shirley Av.
1909 Sandler, Samuel...........Fall River. 53 Franklin St.
1904 Sanger, Guy Edward.......Arlington. 1026 Mass. Av.
1918 Sannella, Salvatore.......Springfield. 575 Main St.
1893 Sargent, Ara Nathaniel.... Salem. 116 Federal St.
1920 Sargent, Arthur Forrest...Boston. 240 Newbury St.
1919 Sargent, Francis Barnard. Mattapan (Boston). Taylor Terr.
1889 Sargent, George Amory.... Boston. 46 Hereford St.
1896 Sargent, George Bancroft..Lawrence. 477 Essex St.
1907 Sargent, Oscar Franklyn Libbey Lawrence. 105 Exeter St.
1905 Sargent, Walter Leslie.....Quincy. 1155 Hancock St.
1919 Sartwell, Ransom Harvey..Foxborough. State Hosp.
1913 Saunders, Edmund Louis...Brookline. Office, Boston. 46 Gloucester St.
1920 Saunders, Ernest Terrill..Boston. 311 Beacon St.
1920 Saunders, Sallie Harding..Hopedale. 20 Adin St.
1918 Saunders, Thomas Henry..Webster. 21 Lake St.
1918 Savage, Ross Eliot........Tisbury. Office, Boston. 543 Boylston St.
1908 Savignac, Arthur Noël.....Amesbury. 80 Friend St.
1907 Sawyer, Alpha Reuben..... Roslindale (Boston). Office, Boston. 483 Beacon St.
1883 Sawyer, Edward Allen.....Gardner. 402 Elm St.
1919 Sawyer, Edward Julius...Boston. City Hospital.
1901 Sawyer, Edward Keyes....Cataumet. Office, Boston. 419 Boylston St.
1884 Sawyer, Elihu LeRoy......†1920 Roslindale (Boston). 6 Conway St.
1891 Sawyer, Walter Fairbanks. Fitchburg. 67 Prichard St.
1888 Sayles, Joseph Borland.... Taunton. 35 Taunton Green.
1905 Scanlan, Thomas John..... Dorchester (Boston). Office, Boston. 419 Boylston St.
1917 Scanlon, Joseph Michael...Lawrence. 477 Essex St.
1903 Scannell, David Daniel.....Boston. 366 Commonwealth Av.
1916 Scarito, Nicholas Julius...Lawrence. 125 Haverhill St.
1912 Schadt, George Leonard....Springfield. 175 State St.
1910 Schillander, Carl Axel.....Springfield. 175 State St.
1910 Schirmer, Joseph Walter...Boston. 272 Newbury St.

1900 Schmidt, Frederick Sextus. Roxbury (Boston). 179 School St.
1906 Schmidt, Richard Diedrich. Dorchester (Boston). 16 River St.
1909 Schneider, Harry Albert... Pittsfield. 86 North St.
1898 Schneider, Jacob Philip.... Palmer. 12 Pleasant St.
1918 Schön, Edward............ Lynn. 664 Western Av.
1905 Schofield, Otho Lester..... Wellesley Hills (Wellesley)
1915 Schofield, Roger William... Worcester. 22 Pleasant St.
1920 Scholz, Samuel Benjamin, Jr. Springfield. Oaks Hotel.
1900 Schorer, Cornelia Bernhardine Johanna Foxboro. State Hospital.
1918 Schubmehl, Frank Edward. Lynn. 117 Green St.
1879 Schwab, Emanuel.......... Cincinnati, O. 2732 Woodburn Av.
1919 Schwager, Solomon........ Pittsfield. 317 North St.
1916 Schwartz, George Harvey.. East Boston (Boston). 43 Princeton St.
1907 Schwartz, Myer........... Lawrence. 118 Franklin St.
1895 Scoboria, Arthur Gilmore.. Chelmsford.
1910 Scott, George Henry....... Roxbury (Boston). 476 Warren St.
1915 Scott, Norman McLean.... Boston. 536 Commonwealth Av.
1887 Scudder, Charles Locke.... Boston. 144 Commonwealth Av.
1920 Seaman, James Alphеus... Springfield. 573 State St
1884 Sears, George Gray........ Boston. 426 Beacon St.
1887 Sears, Henry Francis...... Boston. 86 Beacon St.
1905 Seaver, Edwin Pliny, Jr.... New Bedford. 271 Union St.
1914 Seavey, Hollis Lester...... Cambridge. 1879 Mass. Av.
1917 Sedgley, Frank Robert..... Staten Island, N. Y. Fox Hills Hospital.
1889 Seelye, Ralph Holland..... Springfield. 73 Chestnut St.
1902 Seelye, Walter Clark....... Worcester. 390 Main St.
1918 Segal-Roitman, Jennie .... East Boston (Boston). 46 Saratoga St.
1920 Segal, Samuel, Jr.......... Springfield. 318 Main St.
1915 Segall, Samuel Kelman.... New Bedford. 1208 Acushnet Av.
1905 Segur, Willard Blossom.... Enfield. Bridge St.
1917 Seibels, Robert Emmet .... Springfield. 97 Chestnut St.
1920 Senecal, Raymond Ernst... New Bedford. 1264 Acushnet Av.
1908 Senesac, Archibald Napoleon New Bedford. 74 Butler St.
1914 Sennott, John Ralph....... Cambridge. 321 Broadway.
1901 Sever, James Warren...... Cambridge. Office, Boston. 234 Marlboro' St.
1913 Sewall, Edgar Floyd....... Somerville. 380 Broadway.
1904 Seymour, Malcolm......... Boston. 362 Commonwealth Av.
1911 Shadman, Alonzo Jay...... Boston. 98 Hemenway St.
1919 Shafer, Rudolf Jonas...... Lowell. 810 Broadway.
1916 Shain, Arthur Irving...... Roxbury (Boston). Office, Boston. 130 Salem St.
1881 Shanahan, John †1918 Peabody. 69 Main St.
1896 Shanahan, Thomas Joseph. Brookline. 155 Aspinwall Av.
1910 Shanahan, Timothy Joseph. Arlington. Office, Boston. 419 Boylston St.
1915 Shanks, Charles........... New Bedford. 645 Kempton St.
1913 Shannahan, Richard Joseph Worcester. 839 Main St.
1894 Shannon, Nat Vaughan.... Cambridge. 891 Mass. Av.
1915 Shapira, Albert Abraham.. Boston. 21 Bay State Rd.
1914 Shapira, Victor Isaiah..... Boston. 156 Huntington Av.
1891 Shatswell, James Arthur... Beverly. 9 Endicott St.
1895 Shattuck, Albert Milo...... Worcester. 21 High St.
1873 Shattuck, Frederick Cheever Boston. 135 Marlboro' St.
1873 Shattuck, George Brune.... Boston. 183 Beacon St.
1908 Shattuck, George Cheever.. Boston. 205 Beacon St.
1907 Shaw, Adam Ernest........ Lowell. 137 Merrimack St.
1893 Shaw, Albert Joel......... Boston. 79 Mountfort St.
1893 Shaw, Arthur John........ Boston. 551 Boylston St.
1915 Shaw, Francis............. Somerville. 57 Cross St.
1920 Shaw, Frederick King..... Concord. 1 Stow St.
1904 Shaw, John Port........... Brockton. 6 Main St.
1909 Shaw, John William....... Newburyport. 7 Orange St.
1897 Shaw, Thomas Bond....... Worcester. 24 Oxford St.
1877 Shaw, Thomas Pierpont †1909 Lowell. 110 Eighteenth St.
1918 Shaw, Thomas Wignall.... Whitman. 414 South Av.
1908 Shay, Charles Edwin...... Roxbury (Boston). 136 Warren St.
1895 Shay, Thomas Maguire..... Roxbury (Boston). 88 Warren St.
1897 Shea, John Joseph......... San Diego, Calif. 1668 Main St.
1906 Shea, Michael Ignatius..... Chicopee Falls (Chicopee). 81 Church St.
1902 } 1912 } Shea, Peter Owen........ Worcester. 390 Main St.
1909 Sheahan, George Maurice.. Quincy. 12 School St.
1920 Shedden, William Martindale West Newton (Newton). Office, Boston. Mass. Gen. Hosp.
1916 Sheehan, Edward Bernard. Brookline. 1066 Commonwealth Av.
1897 Sheehan, Martin David.... Stoneham. 34 Pleasant St.
1893 Sheehan, William Joseph... Salem. 146 Federal St.
1905 Sheehan, William Joseph... South Boston (Boston). 355 West 4th. St.
1876 Sheldon, Chauncey Coolidge Lynn. 73 North Common St.
1912 Sheldon, Russell Firth..... Boston. 31 Pinckney St.
1911 Sheppard, Philip Albert Edward Boston. Hotel Oxford. 40 Huntington Av.
1904 Sherburne, Andrew Edward Dorchester (Boston). 46 Brent St.
1913 Sheridan, Philip Edward Anthony South Boston (Boston). 580 Broadway.
1882 Sherman, Frank Morton.... West Newton (Newton). 11 Fairview Ter.
1894 Sherman, Mary Hastings... Brookfield.
1907 Sherman, Warren Hunter.. Lowell. 22 Rutland St.
1914 Shields, Ellwood Emlen.... Annisquam (Gloucester). 39 Leonard St.
1917 Shields, Warren Sylvester. Somerville. 2 Curtis St.
1916 Shine, Honoria Kennelly.. Holyoke. 255 Maple St.
1916 Shinn, Philip Allen........ Gloucester. 90 Middle St.
1919 Shipton, George Marsden.. Pittsfield. 150 North St.
1920 Shirley, John Newton..... Watertown. 98 Nichols Av.
1910 Shoemaker, Amzi Bedell... North Attleborough. 123 Commonwealth Av.
1905 Shoninger, Lee Simon...... New York City, N. Y. 50 West 54th St.
1894 Shores, Harvey Towle...... Northampton. 177 Elm St.
1919 Shortell, Joseph Henry.... Boston. 514 Commonwealth Av.
1869 Shreve, Octavius Barrell †1906 Salem. 29 Chestnut St.
1897 Shultis, Frederick Charles.. Leominster. Columbia Hotel.
1908 Sibley, Benjamin Ernest... Brookline. 12 Fairbanks St.
1916 Silberman, Maurice....... Revere. 53 Winthrop Av.
1896 Silva, Francis Pierce....... Charlestown (Boston). 206 Main St.
1916 Silver, Louis Serebriany.. Malden. 142 Broadway.
1920 Silverman, William Yale.. Dorchester (Boston). 204 Columbia Rd.
1901 Simmons, Channing Chamberlain Boston. 317 Marlboro' St.
1914 Simmons, Edward Burnside. Worcester. 900 Main St.
1905 Simmons, Fred Albert..... Brookline. Office, Boston. 520 Commonwealth Av.
1903 Simmons, Hannah Coralynn Worcester. 900 Main St.
1919 Simmons, Hugh Ludwig... Worcester. 131 Pleasant St.
1920 Simmons, Manfred Elliston Lowell. 61 Central St.
1914 Simmons, Ralph Hayward.. Baltimore, Md. Fort Howard.
1912 Simon, Arthur Leslie...... Lawrence. 50 Eutaw St.
1917 Simon, Harold Francis.... Winchester. 38 Church St.

1919 Simonds, Frederick Artemas Wakefield. 11 Chestnut St.
1920 Simpson, Charles.........Southbridge. 86 Hamilton St.
1885 Simpson, Charles Edward..Lowell. 100 Holyrood Av.
1890 Simpson, James Edwin.....Salem. 26 Chestnut St.
1903 Sims, Frederick Robertson.Melrose. 445 Main St.
1905 Sinelitico, Guiseppe........Lawrence. 3 Jackson Ter.
1920 Siragusa, James Joseph...Brighton (Boston). 736 Cambridge St.
1920 Sisco, Dwight Lewis.......Boston. Mass. Gen. Hosp.
1903 Sise, Lincoln Fleetford.....Medford. Office, Boston. 638 Beacon St.
1896 Siskind, Alexander Louis...Lawrence. 541 Haverhill St.
1913 Sisson, Mitchell...........Boston. 780 Beacon St.
1917 Sisson, Warren Richards..Boston. 293 Marlboro' St.
1917 Skirball, Joseph Jacob....Boston. 353 Commonwealth Av.
1915 Skirball, Louis Irving......Boston. 74 Bay State Rd.
1904 Slack, Francis Hervey.....Brookline. 227 Summit Av.
1920 Slater, Robert.............Boston. 483 Beacon St.
1913 Slattery, John Richard....Brighton (Boston). 736 Cambridge St.
1905 Sleeper, Frank Warren....Dorchester (Boston). 41 Virginia St.
1906 Slutskin, Maurice Louis....Springfield. 120 Main St.
1900 Small, Albert Ernest.......Melrose. Office, Boston. 205 Beacon St.
1908 Smalley, Fred Lyman......Reading. 36 Woburn St.
1898 Smith, Alfred Charles......Brockton. 142 Main St.
1893 Smith, Charles Morton.....Boston. 437 Marlboro' St.
1900 Smith, Charlotte Stewartson Manchester, N. H. 46 Hanover St.
1916 Smith, Chiron Waterville..Marlborough. 38 West Main St.
1914 Smith, Conrad............Boston. 510 Commonwealth Av.
1920 Smith, Curtis Everett.....Boston. Mass. Gen. Hosp.
1901 Smith, Edward Shepard....Westfield. 93 Elm St.
1916 Smith, Edwin Eugene.....Wollaston (Quincy). 50 Beach St.
1912 Smith, Edwin Wallace.....Boston. 510 Commonwealth Av.
1915 Smith, Ernest Elmer......Worcester. 28 Pleasant St.
1902 Smith, Forster Hanson.....Lowell. 832 Merrimack St.
1900 Smith, Frank Herbert.....Hadley.
1894 Smith, Frank Simpson.....Pittsburg, Pa. 6333 Glenview Pl.
1895 Smith, Fred Stevens.......North Andover. 5 Third St.
1894 Smith, Frederick Glazier..Somerville. 145 Highland Av.
1882 Smith, George Carroll.....Boston. 483 Beacon St.
1910 Smith, George Gilbert.....Boston. 352 Marlboro' St.
1903 Smith, Hervey Lewis......Springfield. 249 Union St.
1901 Smith, Howard Harry.....Boston. 845 Boylston St.
1906 Smith, John Hall.........Cambridge. Office, Boston. 657 Boylston St.
1910 Smith, John Jay..........Cambridge. 12 Lee St.
1920 Smith, Joseph Andrew....Worcester. 476 Main St.
1920 Smith, Lawrence Weld....Brookline. 87 Browne St.
1887 Smith, Mary Almira †1920 Boston. 33 Newbury St.
1889 Smith, Murdoch Campbell..Lynn. 3 Lee Hall.
1906 Smith, Myrtle.............Shrewsbury. Prospect St.
1897 Smith, Peter Matthew.....Boston. 758 Tremont St.
1908 Smith, Richard Mason.....Boston. 355 Marlboro' St.
1874 Smith, Samuel Finley......Indian Orchard †1918 (Springfield). 97 Myrtle Av.
1906 Smith, Stafford Baker....New York City. 160 W. 87th St.
1894 Smith, Thomas Burke.....Lowell. 84 Middlesex St.
1884 Smith, Walter Anson.......Shelburne Falls (Shelburne) Box 461.
1914 Smith, William David.....Boston. 99 Commonwealth Av.
1898 Smith, William Henry.....Brookline. Office, Boston. 8 Marlboro' St.
1891 Smith, William Lord......North Grafton (Grafton). Office, Boston. 2 Newbury St.
1917 Smith-Petersen, Marius Nygaard Boston. 166 Newbury St.
1894 Smithwick, Marsena Parker Boston. 483 Beacon St.
1902 Smyser, Charles James....New Wilmington, Pa.
1911 Smyth, Duncan Campbell..Brookline. Office, Boston. 375 Commonwealth Av.
1905 Smyth, Patrick Somers....Brookline. Office, Boston. 69 Newbury St.
1903 Snow, Frank Whipple......Newburyport. 24 Essex St.
1899 Snow, Frederick Stedman..Roxbury (Boston). 151 Townsend St.
1908 Sobotky, Irving...........Boston. 483 Beacon St.
1915 Solomon, Harry Caesar....Jamaica Plain (Boston). Office, Boston. 483 Beacon St.
1919 Solomon, Sidney Joseph...Everett. 360 Main St.
1894 Sopher, Curtis Levi........Wakefield. 6 Avon St.
1897 Soule, Horace John........Winthrop. 180 Winthrop St.
1904 Southard, Mabel Austin....Cambridge. 70 Francis Av.
1900 Soutter, Robert............Boston. 133 Newbury St.
1917 Sowles, Horace Kennedy...Boston. 279 Clarendon St.
1904 Spaid, Charles Jacob.......Springfield. 344 Belmont Av.
1897 Spalding, Fred Maurice....Brookline. Office, Boston. 128 Newbury St.
1903 Spalding, Roger...........Duxbury. Washington St.
1884 Sparhawk, Clement Willis †1919 Middleton. Liberty St.
1914 Sparks, Ernest Elliot......Cochituate (Wayland). Main St.
1910 Sparrow, Charles Atsatt...Worcester. 19 Elm St.
1911 Spaulding, John Doliver Boston. 10 Kenmore St.
1907 Spear, Louis Mahlon.......Boston. 483 Beacon St.
1919 Spellissy, Frank Thomas...Worcester. City Hosp.
1915 Spinney, Frederic Ira......Boston. 4 Columbus Sq.
1909 Spooner, Lesley Hinckley..Boston. 520 Commonwealth Av.
1860 Sprague, Francis Peleg....Boston. 229 Commonwealth Av.
1873 1891 Sprague, Rufus William Charlestown (Boston). 376 Main St
1913 Sprague, Russell Bradford. Foxborough. State Hosp.
1904 Sproull, John..............Haverhill. 50 Merrimack St.
1892 Stacey, Charles Franklin...Boston. 456 Audubon Rd.
1902 Stack, Charles Francis.....Hyde Park (Boston). 1315 River St.
1908 Stack, John Joseph........Address unknown.
1913 Stafford, Frank Dalmon....North Adams. 56 Summer St.
1920 Stames, Theodore Albert..Lowell. 296 Stevens St.
1907 1917 Stammers, Joseph Collins New York City, N. Y. 117 W. 79th St.
1880 Standish, Myles...........Boston. 51 Hereford St.
1909 Stanley, Francis Guy......Beverly. 144 Cabot St.
1895 Stanley, Josiah Murch.....Northborough. Main St.
1907 Stansfield, Clarence Winfield Fall River. 53 Franklin St.
1915 Stansfield, Oliver Holt.....Worcester. 22 Pleasant St.
1903 Stanton, Joseph...........Brighton (Boston). Office, Boston. 520 Beacon St.
1908 Stanwood, Frederic Arthur. Wellesley Hills (Wellesley). 342 Washington St.
1905 Staples, Clarence Hathorne Malden. 339 Pleasant St.
1893 Stapleton, Richard Henry..Worcester. 146 Franklin St.
1893 Starbird, Edward Perley...Dorchester (Boston). 9 Monadnock St.
1910 Stearns, Albert Warren....Billerica. Office, Boston. 520 Commonwealth Av.
1903 Stearns, Robert Thomas...Mattapan (Boston). 24 Hazelton St.
1868 Stebbins, George Stanford †1905 Springfield. 26 Maple St.

1874 Stedman, George †1920 Boston. 1069 Boylston St.
1874 Stedman, Henry Rust......Brookline. Office, Boston. 48 Beacon St.
1901 Steele, Albert Edward..... Roslindale (Boston). 61 Robert St.
1916 Steele, George Louis......West Springfield. 282 Westfield St.
1913 Steeves, Ernest Colpitt.....Essex. Main St.
1918 Steffen, Anna Elizabeth....Boston. Long Island Hosp.
1920 Stein, Louis Charles......Boston. City Hosp.
1919 Steinberg, Naaman........Roxbury (Boston). 73 Humboldt Av.
1907 Stephens, Frederick Newton Somerville. 390 Broadway.
1883 Stephenson, Franklin Bache †1913 U. S. Navy (retired). Claremont, Calif. 425 Harvard Av.
1914 Sternberg, Joseph Edward..Dorchester (Boston). Office, Boston. 100 Boylston St.
1898 Stetson, Frank Eliot.......New Bedford. 334 Union St.
1898 Stetson, Frederick Winslow.Roxbury (Boston). 504 Warren St.
1896 Stetson, Halbert Greenleaf.Greenfield. 39 Federal St.
1894 Stevens, Charles Benjamin.Worcester. 61 Pearl St.
1868 Stevens, Edmund Horace...Cambridge. 1911 Mass. Av.
1874 Stevens, George Beckwith †1911 Dorchester (Boston). 346 Seaver St.
1906 Stevens, Harold Elmer Ellsworth Lewiston, Me. 671 Main St.
1897 Stevens, Henry Burt.......West Roxbury (Boston). Office, Boston. 520 Commonwealth Av.
1891 Stevens, Henry Lawrence..New Bedford. 133 Kempton St.
1908 Stevens, Horace Paine.....Cambridge. Office, Boston. 520 Commonwealth Ave.
1897 Stevens, Sara Elmina......Honolulu, Hawaii. 2329 East Manoa St.
1886 Stevens, Seriah............Roslindale (Boston). 942 South St.
1915 Stevens, William Russell...Abington. 64 Center Av.
1914 Stevenson, Effie Allyne.... Hathorne.
1904 Stevenson, Willis Mack.... North Easton (Easton). Lincoln St.
1909 Stewart, Ralph Carroll....Lowell. 226 Central St.
1909 Stewart, Vernon Champney Woburn. 505 Main St.
1903 Stick, Henry Louis........Baldwinsville (Templeton).
1881 Stickney, Clifford Webster. Holden. Main St.
1892 Stickney, Edwin Pangman. Arlington. 58 Pleasant St.
1884 Stickney, George Augustus. Beverly. 205 Cabot St.
1920 Stickney, Robert Cole.....Beverly, 68 Lothrop.
1905, 1920 Stickney, Whitman Gibson Beverly. 13 Thorndike St.
1891 Stiles, Fred Merritt....... Waltham. 292 Moody St.
1908 Still, Carroll Wilder.......Haverhill. 191 Merrimack St.
1920 Stillman, Raymond Durgin. Worcester. City Hospital.
1880 Stimson, John Woodbury..Fitchburg. 70 Wallace Av.
1899 Stockwell, Herbert Emmons Stockbridge. Main St.
1899 Stoddard, Mortimer Joseph. Springfield. 310 State St.
1914 Stokes, Leroy Tyler........Haverhill. 3 Washington Sq.
1887 Stone, Arthur Kingsbury...Framingham Center. Auburn St.
1893 Stone, Byron..............North Oxford (Oxford).
1894, 1901, 1918 Stone, Ella Gertrude.. Boston. 905 Boylston St.
1886 Stone, Frank Ellsworth....Lynn. 92 So. Common St.
1910 Stone, George Henry.......Roxbury (Boston). P. B. Brigham Hospital.
1914 Stone, Henry Edward......Dorchester (Boston). 41 Fowler St.
1894 Stone, James Savage.......Boston. 286 Marlboro' St.
1912 Stone, Jane Gray..........Otisville, N. Y. Municipal Laboratory.
1854 Stone, Lincoln Ripley †1907 Newton. 131 Vernon St.
1896 Stone, Moses Cornelius †1908 Wellesley. 18 Belair Av.
1905 Stone, Ralph Edgarton.....Beverly. 360 Cabot St.
1909 Stone, Thomas Newcomb..Haverhill. 30 White St.
1888 Storer, Malcolm...........Boston. 476 Boylston St.
1891 Stowell, Edmund Channing.Marlborough, N. H.
1903 Stowell, Frank Edgar......Worcester. 37 Pearl St.
1892 Stowell, Sarah Russell.....Marlborough, N. H.
1920 Strahlman, Louis..........San Diego, Calif. 405 Tinker Bldg.
1902 Stratton, Ralph Ricker....Melrose. 654 Main St.
1904 Street, Charles Edward....Springfield. 2 Maple St.
1900 Street, Lionel Alexander Burnet Shanghai, China. 2A Kiukiang Rd.
1914 Streeter, Edward Clark....Boston. 280 Beacon St.
1905 Streeter, John Frank......Springfield. 55 Walnut St.
1917 Streeter, Howard Alvertus Marblehead. Office, Boston. 546 State House.
1913 Strong, Richard Pearson... Office, Roxbury. 240 Longwood Av.
1915 Strong, Seth Lake.........Marshfield Hills (Marshfield). Office, Boston. 383 Marlboro' St.
1919 Strongman, Bessie Talbot..Pittsfield. Berks. Life Bldg.
1886 Stuart, Frederick William. South Boston (Boston). Office, Boston. 419 Boylston St.
1898 Stubbs, Frank Raymond...Newton. 510 Center St.
1898 Sturgis, Benjamin Franklin, Jr. Salem. 28 Pleasant St.
1896 Sturgis, Walter Horatio Wakeman Allerton (Hull).
1905 Sturnick, Max.............Dorchester (Boston). 12 Columbia Rd.
1892 Stutson, William Peckham †1915 Cummington. Main St.
1899 Sughrue, Dennis Francis...Roxbury (Boston). 430 Dudley St.
1911 Suitor, Henry Albert.......South Deerfield (Deerfield) North Main St.
1910 Sullivan, Andrew Joseph...Brockton. 155 Main St.
1907 Sullivan, Charles Brent....Boston. 520 Beacon St.
1906 Sullivan, Cornelius Augustine South Braintree (Braintree) S Braintree St.
1918 Sullivan, Daniel Thomas...Mansfield. 22 Pleasant St.
1903, 1914 Sullivan, Edward Coppinger Springfield. 289 Main St.
1915 Sullivan, Elizabeth Ann...Framingham. Reformatory for Women.
1916 Sullivan, Eulick Francis...Holyoke. 115 Suffolk St.
1903 Sullivan, Florence Augustine Haverhill. 3 Washington Sq.
1914 Sullivan, Francis Augustus. Cambridge. 376 Cambridge St.
1915 Sullivan, John Albert......Pittsfield. 73 North St.
1901 Sullivan, John Joseph......Dorchester (Boston). 93 Bowdoin St.
1906, 1916 Sullivan, John Joseph.... Lawrence. 301 Essex St.
1907 Sullivan, John Thomas.... Dorchester (Boston). 191 Savin Hill Av.
1913 Sullivan, Joseph Cornelius. Webster. 348 Main St.
1905 Sullivan, Joseph Lawrence. Roxbury (Boston). 89 Waverley St.
1913 Sullivan, Leo Jeremiah.....Fall River. 323 Second St.
1909 Sullivan, Martin George... Winchendon. 107 Central St.
1891 Sullivan, Michael Francis..Lawrence. 13 Pine St.
1913 Sullivan, Patrick Joseph...Dalton. Curtis Av.
1919 Sullivan, Russell Francis..Boston. City Hosp.
1889 Sullivan, William Joseph...Lawrence. 267 Essex St.
1901 Sumner, Harry Herbert....Lowell. 226 Merrimack St.
1896 Sumner, Philip Sosnoski...Boston. 28 Westland Av.
1917 Sundelöf, Ester Mathilda Eleonora..Roxbury (Boston). 88 Moreland St.
1910 Supple, Edward Augustine. Boston. 409 Marlboro' St.
1920 Supple, William Raymond Cambridge. 2350 Massachusetts Av.
1917 Swaim, Loring Tiffany....Cambridge. Office, Boston. 372 Marlboro' St.

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| 1900 | Swain, Howard Townsend | Boston. 226 Commonwealth Av. |
| 1865 | Swan, Charles Walter †1903 | Brandford, Conn. 19 Elm St. |
| 1908 | Swan, Lawrence Clarke | Beverly. 23 Bow St. |
| 1882 | Swan, Roscoe Wesley | Worcester. 4 Harvard St. |
| 1885 | Swan, William Donnison | Cambridge. 167 Brattle St. |
| 1891 | Swasey, Edward | Worcester 390 Main St. |
| 1912 | Sweeney, Bartholomew Philip | Leominster. 30 Water St. |
| 1920 | Sweeney, John Gerard | Hingham. Elm St. |
| 1911 | Sweeney, Michael Thomas | Atlantic (Quincy). 365 Hancock St. |
| 1895 | Sweet, Frederick Benoni | Springfield. 81 Chestnut St. |
| 1893 | Sweetsir, Charles Leslie | Lowell. 276 Westford St. |
| 1889 | Sweetsir, Frederick Ellsworth | Merrimac. 21 Main St. |
| 1907 | Swift, Edith Hale | Boston. 110 Bay State Road. |
| 1901 | Swift, Henry Marshall | Portland, Me. 30 Deering St. |
| 1910 | Swift, John Baker, Jr. | Boston. 374 Marlboro' St. |
| 1907 | Swift, Walter Babcock | Boston. 110 Bay State Road. |
| 1905 | Sylvester, Albie Warren | Pittsfield. 150 North St. |
| 1901 | Sylvester, Charles Porter | Hull. Office, Boston. 460 Audubon Road. |
| 1914 | Sylvester, Nathan Rowland, Jr. | West Somerville (Somerville). 11 Westminster St. |
| 1907 | Sylvester, Philip Haskell | Boston. 25 Bay State Rd. |
| 1893 | Sylvester, William Hillman †1920 | Natick. 6 Clarendon St. |
| 1900 | Symonds, Alice Gertrude | Haverhill. 175 Main St. |
| 1893 | Synan, William Edward | Fall River. 620 William St. |

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| 1902<br>1915 | Tabor, Edward Orlando | Lowell. 196 Merrimack St. |
| 1906 | Talbot, Fritz Bradley | Boston. 311 Beacon St. |
| 1915 | Talbot, John Edward | Worcester. 28 Pleasant St. |
| 1883 | Tallman, Augustus Littlefield | East Boston (Boston). 9 Princeton St. |
| 1915 | Taveira, Arthur Joaquim | New Bedford. 1565 Acushnet Av. |
| 1894 | Taylor, Edward Wyllys | Boston. 527 Beacon St. |
| 1903 | Taylor, Erwin Hartwell | Pittsfield. 316 North St. |
| 1901 | Taylor, Frederick Leon | Roxbury (Boston). 45 Center St. |
| 1893 | Taylor, George Lyman | Holyoke. 247 Maple St. |
| 1900 | Taylor, James, Jr. | Worcester. 49 Pearl St. |
| 1900<br>1916 | Taylor, John Danforth | East Boston (Boston). 31 Princeton St. |
| 1919 | Taylor, John Houghton | Cambridge. 1735 Mass. Av. |
| 1909 | Taylor, Roy Arnold | Waltham. 266 Moody St. |
| 1908 | Taylor, Walter | Florence (Northampton). 70 Maple St. |
| 1909 | Tedford, Ada Helena | Woburn. 51 Pleasant St. |
| 1919 | Teh Tso, Ernest | Roxbury (Boston). 300 Longwood Av. |
| 1880 | Temple, William Franklin | Boston. 377 Beacon St. |
| 1913 | Temple, William Franklin, Jr. | Boston. 377 Beacon St. |
| 1893 | Ten Broeck, Stanton Jacob | Orange. 15 Grove St. |
| 1891 | Tenney, Benjamin | Boston. 308 Marlboro' St. |
| 1886 | Tenney, John Arthur †1921 | Boston. 151 Huntington Av. |
| 1894 | Tenney, William Northend | Canton. Office, Boston. 1038 Old South Bldg. |
| 1913 | Tennis, Matthew Nicholas | Fall River. 538 Prospect St. |
| 1892 | Thayer, Eugene | Roxbury (Boston). Office, Boston. 419 Boylston St. |
| 1901 | Thayer, Hartley Wales | Newtonville (Newton). 355 Walnut St. |
| 1914 | Thom, Douglas Armour | Belmont. Office, Boston. 520 Commonwealth Av. |
| 1912 | Thomas, Elmer Ellsworth | Northampton. 16 Center St. |
| 1889 | Thomas, John Jenks | Boston. 88 Bay State Rd. |
| 1911 | Thomas, William Kilpack Smith | Cambridge. 1718 Mass. Av. |
| 1897 | Thomes, John Blanchard | Pittsfield. 7 North St. |
| 1914 | Thompson, Charles Arthur | Newton Highlands (Newton). 1099 Walnut St. |
| 1903 | Thompson, Charles Edward | East Gardner (Gardner). State Colony. |
| 1891 | Thompson, Charles Oscar | Boston. 589 Beacon St. |
| 1870 | Thompson, Frederick Henry †1920 | Fitchburg. 3 Pleasant St. |
| 1904 | Thompson, Frederick Henry, Jr. | Fitchburg. 168 Prichard St. |
| 1906 | Thompson, George Hocken | North Adams. 18 Ashland St. |
| 1917 | Thompson, Herbert Ellery | Augusta, Me. Hygienic Laboratory. |
| 1915 | Thompson, John Stephen | Cambridge. 1525 Cambridge St. |
| 1898 | Thompson, Peter Hunter | Boston. 308 Commonwealth Av. |
| 1899<br>1919 | Thompson, Richard Henry | Malden. 35 Washington St. |
| 1887 | Thorndike, Augustus | Boston. 601 Beacon St. |
| 1887 | Thorndike, Paul | Boston. 24 Marlboro' St. |
| 1903 | Thorndike, Townsend William | Boston. 24 Newbury St. |
| 1920 | Thorndike, William Tecumseh Sherman | Boston. 22 Marlboro' St. |
| 1893 | Thornton, James Brown | Boston. 168 Huntington Av. |
| 1907 | Thurber, Madison Templeton | Dorchester (Boston). 91 Savin Hill Av. |
| 1915 | Tiani, Bernardo | Lawrence. 88A Lawrence St. |
| 1915 | Tibbetts, Guy Daniel | Antrim, N. H. |
| 1890 | Tibbetts, James Thomas | Mineola, N. Y. 16 Mineola Boulevard. |
| 1890<br>1904 | Tigh, Frederick | Newburyport. 140 High St. |
| 1908 | Tighe, Michael Aloysius | Lowell. 743 Bridge St. |
| 1899 | Tilden, Irving Niles | Mattapoisett. Barstow St. |
| 1913 | Tilton, Earle Edward | Newton. Office, Boston. 483 Beacon St. |
| 1892 | Tilton, Frank Herbert | East Boston (Boston). 15 Princeton St. |
| 1882 | Tilton, Josiah Odin | Lexington. |
| 1920 | Tilton, Warren Norwood | Boston. 645 Beacon St. |
| 1911 | Timmins, Edward Francis | South Boston (Boston). 527 Broadway. |
| 1901 | Tingley, Louisa Paine | Boston. 9 Mass. Av. |
| 1906 | Tinkham, Oliver Goldsmith | Allston (Boston). Office, Boston. 520 Commonwealth Av. |
| 1893 | Tirrell, Vinson Meader | South Weymouth (Weymouth). |
| 1881 | Titcomb, George Eugene | Concord. 7 Sudbury St. |
| 1912 | Titus, Raymond Stanton | Boston. 311 Beacon St. |
| 1880 | Tobey, George Loring | Clinton. 205 Church St. |
| 1907 | Tobey, George Loring, Jr. | Boston. 416 Marlboro' St. |
| 1916 | Tobey, Harold Grant | Boston. 416 Marlboro' St. |
| 1906<br>1919 | Tolman, Henry, Jr. | Salem. 113 Federal St. |
| 1886 | Tolman, Julia | Arlington. 695 Mass. Av. |
| 1913 | Tomkies, James Scott | Dallas, Texas. St. Paul Sanatorium. |
| 1920 | Tompkins, Byron Vincent | Sheffield. |
| 1906 | Toohey, Thomas Victor | Brookline. Office, Roxbury (Boston). 129 St. Alphonsus St. |
| 1911 | Toppan, Roland Lesley | Newburyport. 148 High St. |
| 1904 | Torbert, James Rockwell | Boston. 252 Marlboro' St. |
| 1914 | Torney, George Henry | Brookline. Bournewood Hospital, 300 South St. |
| 1913 | Torrey, Arthur Stanley | Gloucester. 164 East Main St. |
| 1914 | Towle, Clarence Clarke | Somerville. 139 Walnut St |
| 1908 | Towle, Edwin Dudley | Salem. 2 Mason St. |
| 1891 | Towle, Harvey Parker | Boston. 453 Marlboro' St. |
| 1877 | Towle, Henry Charles | Dorchester (Boston). 1428 Dorchester Av. |

1915 Towne, Edward Bancroft..Palo Alto, Calif. 1005 Bryant St.
1885 Townsend, Charles Wendell Boston. 205 Beacon St.
1901 Townsend, David..........Brookline. 9 Irving St.
1901 Tozier, Charles Herman...Winchester. Office, Boston. 100 Boylston St.
1891 Tracy, Edward Aloysius....Dorchester (Boston). 50 Hancock St.
1905 Tracy, John Matthew......Springfield. 632 State St.
1910 Tracy, William Leighton...Pittsfield. 346 North St.
1901 Trainor, John Brett.......Fall River. 1515 South Main St.
1906 Trainor, Joseph Aloysius...Cambridge. 103 Belmont St.
1917 Trask, Harry Wallis.......West Boylston.
1906 Trask, John Wilson........Lynn. 171 Lewis St.
1906 Trayes, William Henry....Boston. 511 Mass. Av.
1894 Treanor, John Peter.......Dorchester (Boston). 3 Howes St.
1912 Tripp, Edwin Prescott.....Falmouth. Locust St.
1897 Tripp, George Alston......Worcester 477 Cambridge St.
1919 Troupin, Abraham Solomon.Boston. 41 McLean St.
1885 Trowbridge, Edward Henry Worcester. 28 Pleasant St.
1893 Trueman, Harmon Silas... Somerville. 145 Sumner St.
1915 Trueman, Nelson Gore.....Salem. 41 Dearborn St.
1903 Truesdale, Philemon Edwards Fall River. 151 Rock St.
1915 Trull, Alfred Chase........Haverhill. 3 Washington Sq.
1868 Trull, Washington Benson †1912 Boston. 18 West Cedar St.
1909 Tryon, Geneva.............Dorchester (Boston). State Hospital.
1906 Tucker, Arthur Wallace....Lynn. 285 Western Av.
1908 Tucker, George Everett....Salem. 86 Federal St.
1894 Tucker, Samuel Chase.....Peabody. 16 Chestnut St.
1911 Tuholski, David Benjamin..Brockton. 105 Main St.
1891 Tully, Edward Joseph......Fitchburg. 98 Prichard St.
1875 Tupper, Augustus Maclauchlan Rockport. Main St.
1914 Turetsky, William Leo.....Dorchester (Boston). 1077 Blue Hill Av.
1912 Turnbull, John Archibald Allston (Boston). Office, Boston. 520 Commonwealth Av.
1907 Turner, Charles Sampson..Providence, R. I. 940 Broad St.
1910 Turner, William Kenneth..New Bedford. 1105 Acushnet Av.
1887 Tuttle, Albert Henry......Cambridge. Office, Boston. 1083 Boylston St.
1879 Tuttle, George Thomas....Milton. 110 Highland Av.
1882 Twitchell, George Pierce...Greenfield. 23 Franklin St.
1886 Twombly, Edward Lambert Boston. 416 Marlboro' St.
1905 Tyler, Winsor Marrett.....Lexington. 454 Mass. Av.
1910 Tynan, Joseph Patrick.....South Boston (Boston). 801 Broadway.
1904 Tyrode, Maurice Paul Octave Véjux Boston. 416 Marlboro' St.
1906 Tyzzer, Ernest Edward....Wakefield. Office, Roxbury (Boston). 240 Longwood Av.

## U

1920 Ullian, Louis Joseph......Boston. 68 Bay State Rd.
1920 Ulrich, Helmuth..........Kendal Green (Weston). North Av.
1912 Underhill, Elizabeth Colden South Hadley. Mt. Holyoke College.
1914 Uniac, Thomas Vincent....Lawrence. 133 Haverhill St.
1897 Upton, Charles Louis......Shelburne Falls (Shelburne). Main St.

## V

1893 Valentine, Henry Charles..Lexington.
1892 Van Allen, Harvey Ward..Springfield. 19 Maple St.
1917 Van Deursen, George Livesay Lowell. 20 Palmer St.
1916 Van Gaasbeek, George Henry Springfield. 29 Berkeley St.
1919 Van Gaasbeek, Harold.....Chicopee Falls (Chicopee). 167 Broadway.
1908 Van Nüys, Fresenius......Weston. Central Av.
1914 Varney, Elton Murray.....Peabody. 72 Main St.
1895 Varney, Fred Elbridge.....North Chelmsford (Chelmsford).
1920 Vartanian, Mardiros Bedros Lawrence. 147 Haverhill St.
1920 Vaughan, Herbert Games..Attleborough. Sanitarium, Park St.
1897 Vaughan, Jonas Hobart....Dighton.
1912 Verde, Luigi.............Cambridge. Office, Boston. 372 Hanover St.
1902 Verhoeff, Frederick Herman Boston. 101 Newbury St.
1919 Vershbow, Nathan.........Hartford, Conn. 813 Park St.
1919 Vickery, Eugene Augustus.Boston. 645 Beacon St.
1882 Vickery, Herman Frank....Brookline. 26 Chestnut St.
1892 Vickery, Lucia Florence...Jamaica Plain (Boston). 27 Lakeville Place.
1897 Vietor, Agnes Caecilia.....Boston. 175 Dartmouth St.
1919 Viets, Henry Rouse, Jr.....Albany, N. Y. University Club.
1878 Viles, Clarence Albertus...Lowell. 855 Bridge St.
1904 Vincent, Beth.............Boston. 295 Beacon St.
1917 Vivian, William James....Worcester. State Hosp.
1916 Voorhis, Kathalyn.........Worcester. 28 Pleasant St.
1897 Vose, Robert Henry........Boston. 443 Beacon St.
1905 1919 Vrooman, Earle Morey...North Adams. 98 Park Av.

## W

1916 Wadden, Joseph Matthew..Cambridge. 69 Concord St.
1902 Wadsworth, Richard Goodwin Boston. 520 Commonwealth Av.
1914 Wagner, Emma Juliet......West Somerville (Somerville). 370 Highland Av.
1919 Wagner, Harvey Samuel...Pocasset (Bourne).
1914 Wainshel, Percy William...Lynn. 176 Summer St.
1920 Waite, Anna Jeannette....Worcester. 84 Pleasant St.
1908 Waite, Lucy Reed.........Southbridge.
1886 Wakefield, Albert Tolman..Sheffield.
1906 Walch, Joseph Francis.....Lawrence. 66 East Haverhill St.
1904 Walcott, Henry Joel.......Concord. 92 Main St.
1863 Walcott, Henry Pickering..Cambridge. 11 Waterhouse St.
1913 Walker, Clifford Black....Springfield. 317 Main St.
1902 Walker, David Harold.....Boston. 390 Commonwealth Av.
1920 Walker, Edmund Eugene Watlington Hamilton, Bermuda.
1908 Walker, Harry Abram.....Somerville. 464 Broadway.
1910 Walker, Irving James......Allston (Boston). Office, Boston. 520 Commonwealth Av.
1914 Walker, Isaac Chandler....Brookline. Office, Boston. 483 Beacon St.
1915 Walker, Melvin Harvey, Jr. Pittsfield. 18 Bank Row.
1918 Walker, Waldo Webster...West Somerville (Somerville). Office, Boston. 293 Commonwealth Av.
1894 Walker, William..........Revere. 780 Winthrop Av.
1905 Walker, William Dacre....Andover. 121 Main St.
1876 Wallace, Alonzo Stewart...Nashua, N.H. 198 Main St.
1905 Wallace, Anna Marie......Waverley (Belmont). Lock Box C.
1898 Wallace, George Loney.....Wrentham.
1917 Wallace, John ............Roxbury (Boston). 219 Warren St.
1899 Walsh, Charles Joseph.....Arlington. 223 Mass. Av.
1913 Walsh, Edmund Francis...Boston. 121 Pinckney St.
1920 Walsh, James Henry......Fall River. 814 President Av.
1904 Walsh, John Edward......Revere. 238 Beach St.

1880 Walton, George Lincoln.... Boston. Hotel Ludlow, Copley Sq.
1897 Walton, William Joseph... Dorchester (Boston). 106 Bowdoin St.
1886 Ward, George Otis........ Worcester. 875 Main St.
1919 Ward, John Clement....... Worcester. 974 Main St.
1904 Ward, Roy Joslyn......... Worcester. 9 Bellevue St.
1913 Ward, William Greenleaf.. Lynn. 150 Essex St.
1907 Wardle, Henry........... Fall River. 923 Second St.
1907 Wardwell, James Knight.. Boston. 1111 Boylston St.
1908 Warner, Carmillus Turten. Marlborough. 75 West Main St.
1901 1920 Warren, Alva Harding.... Everett. 634 Broadway.
1917 Warren, Charles Fletcher.. Amesbury. 155 Main St.
1905 Warren, Edward Dane..... Holyoke. 283 Maple St.
1905 Warren, Franklin Lafayette Bridgewater. Central Sq.
1908 Warren, Hobart Endicott.. Beverly Farms (Beverly).
1909 Warren, John............ Boston. 58 Beacon St.
1866 Warren, John Collins...... Boston. 58 Beacon St.
1907 Warren, Lizzie Maude..... Waverley (Belmont). Box 344.
1909 Warren, Thomas Francis.. Fall River. 341 Washington St.
1892 Washburn, Elliott......... Providence, R. I. 109 Washington St.
1899 Washburn, Frank Hall.... Holden. Main St.
1897 Washburn, Frederic Augustus Boston. Mass. Gen. Hospital.
1886 Washburn, George Hamlin. Boston. 238 Commonwealth Av.
1901 Waterman, George Arthur. Boston. 2 Marlboro' St.
1916 Waters, James Edward.... Gardner. 21 Parker St.
1919 Watkins, Harvey Middleton Palmer. Monson State Hosp.
1895 Watkins, Royal Phillips... Worcester. 17 West St.
1878 Watson, Francis Sedgwick. Boston. 92 Marlboro' St.
1899 Watson, Frank Gilman.... Dorchester (Boston). 11 Virginia St.
1911 Watters, Henry........... Newton Center (Newton). 47 Grafton St.
1907 Watters, William Henry.. West Roxbury (Boston). Office, Boston. 496 Commonwealth Av.
1915 Watts, Harry Adelbert.... Malden. Office, Boston. 2 Park Sq.
1894 Watts, Henry Fowler Ransford Dorchester (Boston). 6 Monadnock St.
1908 Webb, Harold Randall.... Arlington. 409 Mass. Av.
1880 Webber, Frederick Ward.. Newton. 465 Center St.
1865 Webber, Samuel Gilbert †1911 West Roxbury (Boston). 15 Elgin St.
1915 Webber, Wolfert Gerson... Brookline. 207 Winchester St.
1919 Webster, Frederick Alonzo. Beverly. Office, Boston. 466 Commonwealth Av.
1888 Webster, George Arthur... Roxbury (Boston). 53A Dale St., Box 74.
1890 Weeks, Joshua Franklyn.. New Bedford. Lund's Cor.
1920 Wein, Barnet Maurice..... Roxbury (Boston). 112 Homestead St.
1920 Weinburg, Philip Bacon... Brockton. Brockton Hosp.
1894 Weiser, Walter Rupert.... Springfield. 340 Bridge St.
1894 Welch, Edward John...... Lowell. 491 Lawrence St.
1913 Weller, John Henry...... State Farm (Bridgewater).
1920 Welles, Edward Sawtelle.. Boston. 137 Peterboro' St.
1912 Wells, Charles Edward.... Boston. Mass. Gen'l Hosp.
1907 Wells, David Washburn... West Newton (Newton). Office, Boston. Hotel Westminster, Copley Sq.
1920 Wells, Elwin Harrison.... Wakefield. 30 Avon St.
1920 Wentworth, Lowell Franklin Melrose. 19 Bartlett St.
1909 Wentworth, Mark Hunking Concord, 26 Lexington Rd
1874 Wescott, William Henry †1913 Roxbury (Boston). 66 Clifton St.
1880 West, Edward Graeff...... Roxbury (Boston). 630 Warren St
1910 West, Frederick Orra..... Woburn. 60 Pleasant St.
1894 West, George Leon........ Newton Center (Newton). 860 Beacon St.
1920 West, Gustav Frederick... Roxbury (Boston). 14 Moreland St.
1894 Weston, George Dake...... Springfield. 89 Maple St.
1882 Wetherbee, Roswell....... Cambridge. 798 Mass. Av.
1898 Wetherell, Arthur Bryant.. Holyoke. 180 Chestnut St.
1919 Wetherell, Bryant Davis... Boston. 479 Beacon St.
1915 Wheatley, Frank Edward.. Wollaston (Quincy). Office, Boston. 520 Beacon St
1884 Wheatley, Frank George.. North Abington (Abington). 174 Adams St.
1893 Wheeler, Alfred Augustus. Leominster. 69 West St.
1894 Wheeler, Charles Douglas.. Worcester. 18 Chestnut St.
1908 Wheeler, Charles Holmes.. Haydenville (Williamsburg).
1897 Wheeler, Emma Hammond. New Bedford. 57 Morgan St.
1870 Wheeler, Leonard......... Worcester. 12 Chestnut St.
1900 Wheeler, Lucia Anna...... Waterville, Maine.
1919 Wheeler, William Davidson. Revere. 243 Campbell Av.
1915 Wheet, Harry Ray......... Boston. 514 Commonwealth Av.
1906 Whelan, Charles.......... Hingham. Office, Boston. 375 Commonwealth Av.
1910 Whelan, Edmond Vincent.. Springfield. 363 North Main St.
1894 Whipple, Farrington Hasham Portland, Me. 439 Congress St.
1885 Whitaker, Clarence Wilder Worcester. 44 Pleasant St.
1916 Whitcomb, Clarence Adelbert Springfield. Springfield Hospital.
1910 White, Arthur Joseph..... Mattapan (Boston). 249 River St.
1894 White, Belle Platt........ Springfield. 182 Sumner Av.
1893 White, Charles James..... Boston. 259 Marlboro' St.
1902 White, Clifford Allen...... Granville. P. O. Box 150.
1896 White, Franklin Warren... Boston. 322 Marlboro' St.
1914 White, George Arthur..... Cambridge. 170 Harvard St.
1912 White, Henry Alverado.... Taunton. 43 West Britannia St.
1882 White, Herbert Warren... Roxbury (Boston). 151 Humboldt Av.
1910 White, John Robert....... Washington, D. C. Navy Med. School.
1920 White, Joseph Warren.... Roxbury (Boston). 15 Forest St.
1893 White, Leon Edward...... Wellesley. Office, Boston 390 Commonwealth Av
1872 White, Levi †1921 Worcester. 11 Henshaw St.
1909 White, Lucy Nye.......... Maynard. Am. Wool Co.
1899 White, Michael William.... Somerville. 21 Walnut St.
1911 White, Paul Dudley....... Boston. Mass. Gen. Hosp.
1892 White, William Allen..... Roxbury (Boston). 249 Warren St.
1894 Whitehill, George Edward. Everett. 516 Broadway
1920 Whitehouse, Eugene Dizer Quincy. 644 Hancock St.
1897 Whiteside, George Shattuck Portland, Ore 710 Dekum Bldg
1892 Whiting, George Washington Whitney Somerville. 282 Broadway.
1906 1916 Whitman, Luther Oakes.. Amherst. 9 Amity St.
1886 Whitney, Charles Melville. Boston. 386 Commonwealth Av.
1905 Whitney, Edward William. Northampton. State Hosp.
1910 Whitney, George Burgess.. Haverhill. 3 Washington Sq.
1901 Whitney, Harriet Wiley... Northampton. State Hosp.
1905 Whitney, Ray Lester...... Guelph, Canada. Homewood Sanatorium.
1904 Whiton, Ross Kittredge.... Bedford.
1910 Whittemore, William Stewart Cambridge. 39 Brattle St.
1906 Whittemore, Wyman...... Boston. 199 Beacon St.
1891 Whitten, George Edwin... Haverhill. 154 Main St.
1887 Whittier, Francis Fremont †1920 Brookline. Office, Boston. 149 Tremont St.

1900 Whoriskey, John Joseph.. Cambridge. Office, Boston 45 Bay State Rd
1914 Wickham, Thomas William Boston. 483 Beacon St.
1887 Wilbur, Sarah Mann †1920 Springfield. 319 State St.
1910 Wilcox, De Witt Gilbert... Boston. 496 Commonwealth Av.
1907 Wilcox, Henry Hopson.... Springfield. 151 North Main St.
1920 Wilcox, John Maxon...... Woburn. 38 Pleasant St.
1920 Wilder, Edward Wheeler.. Dorchester (Boston). 90 Columbia Rd.
1906 Wilder, Winford Oliver... Springfield. 175 State St.
1906 Wilinsky, Charles Francis. Boston. 80 Green St.
1914 Wilkins, George Arthur.... Revere. 646 Beach St.
1900 Wilkins, George Clarence.. Manchester, N. H. 402 The Beacon.
1909 Wilkins, Samuel Henry... West Medford (Medford). Office, Boston. 135 Newbury St.
1917 Willey, Walter Brown, Jr.. Everett. 545 Broadway.
1898 Williams, Abram Case.... Springfield. 137½ State St.
1894 Williams, Augusta Gilbert. Brookline. 136 Cypress St.
1920 Williams, Charles Amory.. Brookline. 35 Walnut Pl.
1887 Williams, Charles Crosby. †1920 Los Angeles, Calif. 401 So. Hope St.
1915 Williams, David Lawrence. Boston. 390 Riverway.
1902 Williams, Edward Denison. Easthampton. 27 Union St.
1894 Williams, Edward Russell. Cambridge. Office. Boston. 338 Commonwealth Av.
1877 Williams, Francis Henry.. Boston. 505 Beacon St.
1894 Williams, Frank Percival.. Brookline. Office, Boston. 483 Beacon St.
1916 Williams, Frederick Horace Brookline. Office, Boston. 236 Clarendon St.
1917 Williams, Frederick Russell Worcester. 11 Elm St.
1880 Williams, Harold.......... Boston. 528 Beacon St.
1887 Williams, Henry Clarence. Boston 130 Newbury St.
1899 Williams, Hugh........... Boston. 301 Beacon St.
1906 Williams, John Thomas.... Boston. 483 Beacon St.
1882 Williams, Joseph.......... Dorchester (Boston). 12 Bloomfield St.
1917 Williamson, Cordelia Isabella Boston. 3 Spruce St.
1898 Willis, Charles Austin..... Waltham. 562 Main St.
1914 Willoughby, Earle Carlisle. North Reading. State Sanatorium.
1894 Wilson, Charles Oscar..... Lowell. 614 Gorham St.
1913 Wilson, Charles Moore.... Salem. 175 Fairmount St.
1910 Wilson, Edmund Winfred. Boston. City Hospital.
1904 Winchester, George Wesley. Mattapan (Boston). 1411 Blue Hill Av.
1888 Winn, Charles Henry..... Roxbury. 1474 Tremont St.
1908 Winslow, Benjamin Sabert. New Bedford. 1065 South Water St.
1893 Winslow, Edward Smith.. Easthampton. 15 Main St.
1903 Winslow, Frederick........ Boston. 275 Clarendon St.
1920 Winsor, Allen Pellington.. Boston. Mass. Gen. Hosp.
1897 Withee, Frederick Elmarien Newton Highlands (Newton). 9 Forest St.
1892 Withington, Alfreda Bosworth Paris France. 23 Rue de la Paix.
1917 Withington, Paul Richmond Milton. Office, Boston. 293 Marlboro' St.
1904 Wolbach, Simeon Burt.... Boston. 420 Beacon St.
1920 Woo, Shutai Tinwang.... Boston. Mass. Gen. Hosp.
1907 Wood, Benjamin Ezra..... Newtonville (Newton). Office, Boston. 520 Beacon St.
1882 1888 Wood, Henry Austin..... Waltham. 755 Main St.
1885 Wood, Leonard............ U. S. Army.
1901 Wood, Nathaniel Knight.. Boston. 520 Beacon St.
1911 Wood, Nelson Merwin..... Charlestown (Boston). Office, Boston. 510 Commonwealth Av.
1889 Wood, Norman Perkins... Northfield. Main St.
1919 Wood, William Franklin.. Brighton (Boston). 272 Allston St.
1899 Woodbury, Frank Taylor.. Wakefield. 21 Chestnut St.
1899 Woodbury, Herbert Elwell. Indianapolis, Ind. 1321 No. Meridian St.
1920 Woodbury, Stillman Philetur Millers Falls (Montague).
1891 Woodbury, William Richardson Rochester, N. Y. 32 North Goodman Ave.
1907 Woodill, Edith Esty....... Waverley (Belmont). Lock Box C.
1902 Woodruff, Richard Allen.. Pittsfield. 73 North St.
1899 Woods, Charles Edwin.... Lunenburg. Lancaster Av.
1879 1897 Woods, George Lyman †1915 Springfield. 60 Sherman St.
1882 Woodward, Lemuel Fox... Worcester. 52 Pearl St.
1918 Woodward, LeRoy Albert.. Worcester. 63 Pleasant St.
1877 Woodward, Samuel Bayard Worcester. 58 Pearl St.
1919 Woodward, William Creighton Brighton (Boston). Office, Boston. City Hall Annex.
1879 Woodworth, Dwight Sidney Fitchburg. 882 Main St.
1902 Woodworth, John Dawson Roswell Jamaica Plain (Boston). 9 Greenough Av.
1883 Worcester, Alfred......... Waltham. 751 Main St.
1873 Workman, William Hunter †1912 Worcester.
1901 Wormelle, Charles Burton. Allston (Boston). 186 Brighton Av.
1902 Worth, Edward Philip.... Edgartown.
1904 Worthen, Charles Arthur.. Lynn. 19 Park St.
1896 Worthington, Arthur Morton Dedham. 26 Court St.
1919 Wright, Arthur Clarendon. Haverhill. 70 Emerson St.
1919 Wright, Charles Wardsworth North Adams. 41 Holbrook St.
1894 Wright, James Homer..... Boston. Mass. Gen. Hospital.
1916 Wright, Willard Lyman... Boston. 784 Beacon St.
1910 Wright, William Francis.. Fall River. 160 Robeson St.
1895 Wylie, Eugene Cushman... Dorchester (Boston). 556 Washington St.
1894 Wylie-Cushman, Ella Rosalind Boston. 711 Boylston St.
1912 Wyman, Edwin Theodore.. Boston. 483 Beacon St.

## Y

1897 Yenetchi, Henry Ainsworth Somerville. 104 Highland Av.
1895 Yoosuf, Abraham Kevork.. Worcester. 82 Franklin St.
1915 Young, Annie Roberts..... Waltham. 925 Main St.
1895 Young, Edgar William.... Everett. 640 Broadway.
1910 Young, Edward Lorraine, Jr. Jamaica Plain (Boston). Office, Boston. 279 Clarendon St.
1914 Young, Edward Wallace... New Bedford. 403 Union St.
1897 Young, Ernest Boyen..... Boston. 434 Marlboro' St.
1906 Young, Evangeline Wilson. Boston. 20 Charlesgate W.
1907 Young, James Herbert..... Newton. Office, Boston. 520 Commonwealth Av.
1882 Young, John Francis...... Cambridge. 1010 Mass. Av.
1905 Young, Ralph Randal..... Roxbury (Boston). 3 Highland St.
1905 Young, Roy Demas....... Arlington. 788 Mass. Av.
1908 Young, Walter Harding... Dedham. Office, Boston. 543 Boylston St.
1899 Young-Slaughter, Emma Elizabeth Lowell. 100 Westford St.

## Z

1888 Zabriskie, Frank Hunter.. Greenfield. 426 Main St.
1916 Zarrella, Angelo Mario.... Lynn. 268 Chatham St.

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